

FEEDING RULES  
*for*  
HEALTHY INFANTS

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# FEEDING RULES

FOR

## HEALTHY INFANTS

BY

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CONTAINING EDUCATIONAL AND RECORD CHARTS  
SHOWING PRACTICAL PERCENTAGE FEEDING  
WITHOUT LABORATORY ASSISTANCE

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By CHARLES DOUGLAS, M. D.

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THIS BOOK IS RESPECTFULLY  
DEDICATED

TO THE MANY MOTHERS AND NURSES WHO FAITHFULLY AND  
INTELLIGENTLY FILLED ENOUGH OF THE AUTHOR'S EDUCA-  
TIONAL FEEDING CHARTS TO FURNISH OVER FIFTEEN  
THOUSAND DAILY RECORDS OF FOODS GIVEN THEIR  
INFANTS AND ALSO THE RESULTS PRODUCED BY  
THEM. FROM THIS PRACTICAL INFORMA-  
TION, IT HAS BEEN POSSIBLE TO CON-  
STRUCT VERY MANY OF THE  
FOLLOWING PAGES.





## PREFACE

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Many valuable books have been written during the past ten years on the nutrition and proper feeding of infants. From these books, the writer has received valuable assistance in pursuing this branch of pediatrical work.

In doing practical infantile feeding, without the assistance of a Walker-Gordon milk laboratory, the author found it necessary to devise a chart which would be a perfect record of the foods and amounts used daily and one which would also show the exact effects they produced. Use and necessity gradually added important features. These were mainly evolved by the demands of memory when treating many cases, and by the necessity to teach mothers and nurses to concentrate their thoughts and attention on all those features necessary for successful work.

Daily filling of these charts by mothers or nurses made them acutely and intelligently interested in doing careful and exact work. Their thoughts were concentrated on the essentials, and daily filling of each item reminded them of everything needed, thus preventing errors of omission.

This work demanded that the food must be prepared in the way most familiar to them, and, consequently, the old way of raising the cream and then removing it from the skim-milk was adopted. Mothers very easily learned to mix these together in the proportions necessary to suit their infants; to dilute them with water and then sweeten the whole mixture.

This is the method followed in the Walker-Gordon laboratories, when physicians write prescriptions ordering the required proportions of fat (cream), proteids (skim-milk) and sugar for any infant.

As only a very few rich people can ever feed their infants from laboratories, it was necessary to adopt a plan which could be used by all mothers and one which could educate them to change the food themselves when necessary.

On account of its simplicity and suitability to mothers, all foods are designated by ounces, tablespoons and teaspoons, and no effort is made to express them by percentages of fat, proteids or sugar.

Over fifteen thousand daily records of foods given, and their results were obtained in this manner, and from this material as well as from very many unwritten records also, most of the results in the following pages have been obtained. The milk was all kinds that were reasonably pure and clean.

In the following pages appear some things differing from what is generally understood on some points, and also a few things that are entirely new. These differences and everything that is new are the combined product of these charts filled by many mothers unacquainted with each other, and working with different milks in their own homes, on all kinds of infants and at all ages under two years. Their work shows a striking unanimity in results and unmistakably defines many facts which could not be proven in any other way. These charts have been a welcome experience and education to the writer.

CHAS. DOUGLAS.

959 Jefferson Avenue, Detroit, Mich.

## THE LENDING AND BORROWING OF BOOKS

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Contagious diseases are the most frequent cause of sickness in childhood. Aside from digestive disturbances, children are most amenable to contagion in its many forms. Such diseases as diphtheria, scarlet fever, measles, whooping-cough, mumps, chicken-pox, etc., are mostly confined to this period of life. These contagions are conveyed by all objects and persons exposed to them, and many thousands of children are sickened and die in this way every year. Thorough disinfections will destroy these contagions in clothes and all utensils, but no means have ever been found by which books can be disinfected and the contagious poison eliminated from the leaves where it will live for many months, and some claim even longer.

All books on infantile subjects thus become saturated with contagions and are a great source of danger afterwards.

The mother who lends such books is often the innocent means of sickening her friend's children.

The mother who borrows them runs a great risk of also borrowing some serious contagion. These books are safe only in the house where they are owned.



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## CHAPTER I

### INTRODUCTORY

1. We are all children of habit in this world and a great many of our habits, thoughts, customs and even our politics we inherit from our ancestors. If we critically examine ourselves on these different points, we will, in most instances, find that we are saying, doing and thinking so because we learned to do this while we were yet young and inexperienced and because our parents did or said the same thing. In this way, the errors of our ancestors were obtained from their ancestors, and again by these from their ancestors for ages back and finally have been handed down to us in this twentieth century.

2. There is only a very limited portion of humanity who have critically analyzed the habits and thoughts of their ancestors save where they have been compelled to do so during their educational courses in schools, colleges and universities.

3. In these institutions, again, our thoughts are shaped by those older than ourselves, and, in most cases, we accept their doctrines and teachings without giving that crucial analysis which only the matured and experienced mind of the adult enables one to do.

4. It is much easier to learn a new subject aright than to unlearn an old established one, even though it be wrong. Very few of us have the ability, training, strength of mind, independence of thought and particularly the facilities to unlearn the old errors which have become a part of our nature and which we have practised or followed, as abso-

lutely correct, for many years. It is not that educated humanity does not desire to make these corrections, but because they have not the opportunities and facilities necessary to accomplish such a result.

5. In this way, we continue to feed and clothe our infants, in most instances, according to those ancestral rules followed for ages back, without analyzing them carefully to ascertain whether they are right or wrong.

### PERFECT NUTRITION

6. The perfect nutrition of our infants and children, as well as that of all humanity, is entirely dependent upon a knowledge of the proper foods for each individual to consume, the proper amounts of each food to be consumed and those evidences which show that digestion is perfectly performed.

7. There is no department of our educational system which gives to either infants or adults an opportunity to learn this vital and all-important subject; nor is there an educational system in any other government in the world, so far as the writer knows, which affords more opportunities to learn this than does our American system. Just as Americans have made advances in many other lines—scientific, economical and financial—beyond that point reached by many nations, so does it behoove us to continue in our efforts of advancement in all lines where it is apparent that improvement is very necessary.

8. It is needless to dwell upon the great difficulties under which the delicate, weak or crippled labor in this life. We have too many illustrations of this continually before our eyes in all communities and in all parts of our country. If our parents were so educated that they could trace appar-



ent weaknesses back to their origin as clearly and distinctly as can the intelligent physician, there would be such an awakening of the public on these matters as would compel all our educational systems to thoroughly implant and teach the perfect nutrition of humanity as the first and most important subject necessary for successful advances in all branches of education, whether they be in the preparatory work of our youths or in the whole life work of our citizens at large. To all thoughtful, progressive, scientific and experienced physicians, there is no subject of so grave and great importance as this perfect nutrition of the human being (179).

9. The time will come, as it must, when humanity will fully realize that the only sure and safe foundation, upon which rests the future success of both children and adults, is the perfect nutrition of all parts of their bodies. We all know that sick men or women, confined to their beds, are unable to make any physical or mental efforts except in a very limited degree. Between this degree of weakness and that of the perfectly healthy condition, every evidence of inability to perform a full proportion of labor is recognized when due to physical inability; but when it comes to that mental strength necessary for the performance of regular duties, humanity does not recognize or see that there must be the same incapacity in this that they see in the physical condition, and the consequence is that distressing results and failures are continually presented by people whose nutrition is not such as is and should be demanded for every person doing heavy mental labor.

10. The American habit of demanding extraordinary business, professional, scientific, and other forms of mental labor, while we notoriously neglect our meals and the quality of the food which we consume, is very common. We are

continually filling all the different walks of life with failures which could have been and will be avoided when proper nutrition of the body and mind are thoroughly understood and this subject given the first consideration as the foundation of future success.

11. The day will come, in America, and in other countries also, when the principles of human nutrition are taught to the rising generation just as are now taught in our agricultural colleges the different kinds of soils and fertilizers suitable for growing and nourishing grain, flowers, shrubs, and trees, and also the various kinds of food needed for growing and nourishing different animals to the highest state of perfection, whether they are required for the purpose of labor or for the meat-market. Does it not seem an awful reflection upon Americans, as a progressive nation, that all subjects concerning animals and articles which we convert into money, we thoroughly understand and teach, but at the same time, neglect to give our rising population the advantages of knowing and understanding themselves as well as they do all animals and products of the soil?

12. It would seem as if we could not, or would not, look farther into this subject than that distance which has a visible gold or silver lining; in other words, we have paid close attention to all things needed for accumulating the money required in procuring those things necessary for our sustenance and support and fail entirely to reach that point which demands a perfect knowledge of how to use this accumulation to accomplish our own proper support and nourishment and also that of our children.

13. Would it not seem a natural sequence that, having learned how to produce properly and successfully all things needed for the nourishment of humanity, we would most

certainly learn to use them to our greatest advantage, both mentally and physically? Yet, such is the unfortunate position which we intelligent, civilized citizens of this twentieth century occupy. Statistics from all over the country show that we contentedly look on and are satisfied to see thousands upon thousands of our children sicken, fade away and die simply because they are improperly fed, and very many more thousands barely escape death itself, through long and continued sickness, to grow up permanently maimed, crippled or debilitated through damages produced directly upon the digestive organs, or indirectly on other parts of the body which are dependent upon the healthy condition of the digestive tract.

14. We see mental and physical wrecks at all stages and in all walks of life, but we are not well enough educated as a people to analyze these results and trace them back to their origin.

15. We see a thin, pale girl suffering from headache, nervousness and loss of sleep, but we do not recognize that these symptoms are merely the result of her imperfect dietary, her too great confinement to the house and the lack of fresh air while she is trying to study her school lessons.

We see the badly shaped boy with head too large and altogether out of shape, but we do not recognize that, had he been fed properly when an infant, his head would not be of this uncouth form and size.

We see that other boy with bow legs, an object of fun for his class-mates, but we fail to recognize that errors in his food, while he was yet a child a year old, gave his legs this ungainly shape.

We see that other boy or man whose knees are continually in collision with each other as he walks about the

streets and whose efforts in running have always been the cause of laughter for those who saw him, but we do not know that his legs were born straight and merely became crooked because his mother did not know how to feed him correctly. That mother has always wished that he were a girl, so that his skirts would hide his deformity.

In like manner, we can travel through imperfect teeth, badly shaped mouth, muddy complexion, frequent convulsions, diarrhea, dysentery and many other disturbances which an intelligent physician knows are found nearly always in children who are improperly fed and whose nutrition is consequently poor, thus making them susceptible to these disturbances.

16. Does not all this seem a sad commentary upon our boasted intelligence and our vanity? But we are no worse than the rest of the world. Is it not time that we awake as a nation to the realization of our ignorance and weakness on this vital point and make a proper effort to infuse that intelligence and knowledge into ourselves, and especially into our children, which will enable them in days to come to escape either from the grave, from debility, or from that weakened condition of both mind and body from which so many of us suffer at the present day?

17. This will be accomplished gradually just as soon as our young mothers, who have been taught everything else necessary in this life for their benefit and success, realize that they have the opportunity and must learn this also, for the benefit and advantage of their children.

18. The following pages will be devoted to showing what are the different foods necessary for perfect nutrition at different ages and a simple and reliable method of recognizing their correct as well as injurious effects upon the

human body. By this means, they can regulate the dietary of infants and children so as to secure that perfect nutrition at all times which guarantees perfect growth and development, both mentally and physically in children of all ages.

19. These principles which make successful growth and good health in the infant and youth, if always followed, cannot miss in retaining also that good nutrition and health in the adult which always makes success possible to him.

### A MOTHER'S RESPONSIBILITY

20. On this subject, the proper nutrition of infants and children, our mothers are perhaps farther behind the advances of civilization, education, science and progress than on any other subject with which our educational and progressive nation is acquainted. Where is the young mother whose mind is not concentrated most intently, night and day, upon the proper care, growth and development of her infant from the very hour it was born? Just look at the position in which she is too often placed—a graduate from our public schools, high schools, and possibly from colleges or universities—and yet when her first child is born and she is unable to nurse it, she has, forsooth, to ask some old friend, her mother or possibly, even a stranger, “What shall I feed my baby?” Just think of the trouble she has in getting the right answer as against the many wrong answers which she is sure to get just in proportion with the number of times and the number of persons of whom she asks that question. Out of a dozen answers, possibly no two will be precisely the same and very likely not one will be exactly right. Such is the problem which a very young mother encounters. Why should it be so? Ignorance! Ignorance! That is the only answer to give to that question in this en-

lightened day, no matter where it is asked, in city or town, in country or village, anywhere from Maine to California.

21. What a commentary upon our civilization! Yet, there are no members of our community who are keener or more anxious to advance in the right direction and be in the van of progress than our American women; and of these, there are none so keen and anxious on this subject as our American mothers, in their desire and determination to do all and everything they possibly can to secure that good health, strength and development necessary for their children. They fully realize that only good health and perfect development can procure future healthy matured men or women and enable them to compete successfully in the great battle of life before them.

22. It is not the fault of the young mother that she does not have this important information. It is the fault of our educational systems, for they have neglected to teach it. It will continue to be so until the nutrition of the human family is taught to our children as perfectly and as regularly as they are taught to read and write, and if there is any one use to which our educational system could be turned with advantage to themselves, it would certainly be to enable them to study this subject. When this is the case and all our children thoroughly understand what perfect nutrition is, and can regulate the diet according to the evidences thereof at any time, our young mothers will not require to ask, "What shall I feed my baby?" but will immediately give proper directions and also see that they are successfully carried out. Their responsibility will be great, but the duty will be a pleasant one and one in which they will rejoice and take up with a happy heart, always cognizant of a successful result, feeling competent in their ability to do

that which is right and always recognizing promptly when an error has been committed by themselves or any one entrusted to do the work.

23. What a strong contrast will then be our position to that of the present day, where ignorance reigns and this whole work is a mere guessing and trying; guessing and trying by mothers, hoping to find something that will suit the infant's digestive power and give their weary heads and aching limbs a temporary rest and also secure for them quiet sleep. Any mother who has gone through the broken sleep, the tiresome rocking, the back-breaking walking and the incessant weariness that always accompany and follow a cross baby suffering from distressing indigestion, realizes that this is the result of efforts to digest food, the proportions of which are entirely unsuited to its age and tender digestive organs. Her present misery, her future gloomy thoughts and possible acquaintance with the undertaker, are all the result of her ignorance and consequent inability to extricate herself or her child from the painful and distressing position into which she has, like thousands of other mothers in the same position, innocently fallen.

#### THE WORRIED AND ABUSED MOTHER

24. The mother who has an infant that is very difficult to feed and whose growth has been very slow is continually in a very anxious and worried frame of mind. If she has been unfortunate enough to lose an infant previously, this intensifies her situation and she is usually so worried about the little one that she is inclined to talk a great deal regarding it among her friends. This is a mistake on her part, but she does not know it. The fact that she obtains advice from every woman with whom she converses and that



scarcely any two of these women agree on this question, should be proof enough to her that it is a mistake to talk so much about the little one. Usually, the mother with a delicate baby has many callers, all asking about the little one, all giving advice; the sum total of which, when counted up, amounts to six or eight formulas each day. Six or eight advices in a day are not a high estimate of the number the mother frequently receives. This repeated, continually, shows the anxiety and mental abuse to which the young mother is subjected.

25. Where there is such great diversity of advice and suggestions, it is quite evident that there is no golden rule which all know alike and which she can adopt as her guide. If she would realize this fact and think the subject over carefully when alone, she would see that she cannot follow every advice; therefore, she must select one particular course, adopt that one and follow it out intelligently. Trying to work in this way, will naturally drive her to select that course which is backed up by the most reason and intelligence, and such a one as she feels she can herself follow intelligently for her child's success and happiness.

26. Now, who is there who can intelligently advise the young mother on this subject? Is it the mother who has had half a dozen children, now partially grown up, and who has nursed them all until nearly a year old? What experience has she had about hand-feeding infants except during the second year? Does she tell the young mother about the diarrhea, dysentery, fevers, convulsions and other disturbances from which her children suffered during the second summer, while they were strong and vigorous after the successful first year's nursing? She does not know that her irregular feeding and uncertain dietary were the cause



of her own infant's sickness and perhaps death during the second year. Just because she happened to have had half a dozen children whom she nursed during the first year and who were healthy while she nursed them and were sick more or less after she stopped nursing and hand-fed them, she and her friends think that, of course, she must know how to feed a young infant from three to six months old—that which she never did. She often thinks she knows enough to give advice about something which she is sure to spoil if she attempts to do it.

27. Take all the other mothers, perhaps even some also who have never been mothers, yet who, because of their age think they know something about this matter. They, also, presume to advise on this vital subject about which they have had little, and some of them no experience whatever. One of them, perhaps, may have heard of a certain kind of food that did some person's baby good at a critical time. They think it took so and so, and was fed so and so, and, without any reason, they immediately proceed to give indistinct details and great certainties for which they vouch most unhesitatingly.

28. Is there anything so simple in infant feeding that many women presume to know something about it which they think is good enough to try on another woman's delicate little infant? Would these same women presume to suggest to this mother how she should run her house, how to do her cooking or how to conduct herself in company? If they did, they would probably receive a sharp rebuke for their impudence; and yet, on this subject of feeding her infant, which is of far more vital importance to the mother and a subject requiring ten times more intelligence, they unhesitatingly say things and suggest changes for which

they are not at all responsible and about which the great bulk of them invariably know a great deal less than the mother herself.

29. The poor mother who is subjected to this abuse is the victim of their kindly intended pertinacity and their foolish, though well-meant, disposition to recommend something that may, perhaps, be good for the infant, but they do not know whether it will or not. This mother is very much to be pitied for her sufferings and great mental torture through these kindly but cruel and untimely advices, and she continues to suffer from this mental abuse until, through her own study and the education from her physician, she reaches the point where she does not talk about her baby at all, or else she receives the officious advices of her friends in silence and inwardly pities them for their ignorance. The writer sees this result, frequently and constantly, in young mothers with their first infants.

30. In days to come, this mother is competent to give advice to some other mother in like distress. Does she do it? Perhaps she does; but if so, she does it very sparingly. Realizing what an important subject this is, she usually advises the mother to seek instructions from the proper source; that is, from a physician thoroughly competent to advise and direct her. She has learned enough from her own experience in a like condition not to presume to give advice on such a responsible subject and in a matter of such vital importance.

## CHAPTER II

### VARIETIES OF HUMAN MILK

31. There is no food so suitable for a young infant as healthy human milk; and when a mother supplies enough of this to satisfy a healthy infant, its growth and success are assured. While the proper amount of milk of the right quality is the ideal food for an infant, there are only a limited number of mothers who secrete that quality and quantity which insures success. The infant who suffers continually from colic, looseness of the bowels and various kinds of digestive disturbances is certainly not getting a food which guarantees successful growth. It is possible that such an infant would be better off if entirely weaned, providing the weaning was done with a food suited to the child's digestive secretions.

32. In order to thoroughly understand the proper nutriment for the young infant, it is necessary to look at the composition of human milk. Mothers should never consider milk as a single substance. The intelligent physician always looks upon it as a food composed of fat, sugar, proteid and salts, very largely diluted with water.

33. In one hundred parts of human milk, there are eighty-seven and one-half parts of water and only twelve and one-half parts of food. In these twelve and one-half parts of food, there are four of fat, seven of sugar and one and one-half of proteids. This composition shows that nature's plan in feeding is to use a very dilute mixed food, and she has so arranged the digestive glands in the infant that they secrete different fluids suitable for the digestion of these various amounts of fat, sugar and proteids, each fluid being able to dispose of only that particular food

suited thereto. From this, it is plain that each food and the digestive fluid suited to it, must be correctly proportioned to each other for comfortable digestion and consequent successful growth and development.

34. Where we are not able to supply human milk, it behooves us then to seek for a food as nearly similar thereto as possible. Only in the milk of the various animals do we find fat, sugar and proteids at all resembling that found in human milk; consequently, any dietary which does not have milk as the main source of its supply is unsuitable to the digestive power of the newly-born or very young infant. Only when the child becomes older and its digestive power has been materially increased, is it safe to introduce into its dietary any other foods than those which nature has indicated as essential for success (291).

#### INJURIOUS HUMAN MILK

35. Human milk, which is not absolutely perfect, and all forms of hand-feeding are liable to so irritate and damage some digestive glands that their power to secrete the necessary digestive fluid is very much reduced. In this way, the ability of the child to appropriate, perfectly, the amount of food necessary for its proper growth and development is so much lessened that the infant cannot be considered as a perfectly healthy, normal child, and consequently, must be classed as the delicate or crippled one. Where the milk of the mother continually produces many colored mucous or slimy stools (49) and the child ceases to increase in weight, the continuance of such nursing must, necessarily, damage its digestive power, and very soon such infants are so much injured that it is with great difficulty they can be artificially fed thereafter (91). The amount of damage done, in these badly nourished infants, depends

upon their age and the length of time the nursing is continued. The younger the infant is, when thus improperly nursed, the greater is the injury resulting therefrom; and the longer this unsuitable human milk is fed to the infant, the greater, of course, is the injury done to those particular digestive glands which suffer from this unsuitable food.

36. It is important that mothers thoroughly understand this subject, in order to avoid the very serious injuries that they are continually, but innocently, inflicting upon their infants by persevering in nursing them after they have reached that point where their milk is no longer beneficial, but, on the contrary, very injurious. Great damage has been done and continues to be done to our offsprings by the ignorance of mothers on this subject. No mother desires to continue nursing as soon as she knows that her milk is injurious to her infant, but her strong maternal instinct nearly always persuades her that it is not injurious and she persists in nursing when the child suffers from colic, crossness, disturbed sleep, pale countenance and loss of weight, all being accompanied by foul, gassy, mucous or slimy and many colored stools. These symptoms just enumerated should and must be an infallible guide to every intelligent mother as indicating the time when her milk ceases to be nutritious, but has, on the contrary, become injurious to her infant (87).

37. It is hard for the mothers of one or two months to realize this fact. It is also hard for the mothers of four, five or six months to realize this fact; but it is much more distressing for them not to promptly recognize the importance of this unhealthy milk condition while the child is yet healthy and vigorous and its digestive glands are in a proper condition to receive a well selected and suitable food

which can be digested easily and perfectly. Some mothers wait until the child is debilitated and weakened by unsuitable food which is so injurious to its digestive glands that they are unable to secrete the amount requisite to perfectly nourish it. This, unfortunately, is the condition too often seen in delicate infants suffering from malnutrition, nausea, vomiting, diarrhea, and frequently fevers also.

38. From the above facts, it is apparent that the most important feature for the mother to realize while nursing her infant is the necessity for its continual growth and comfort, and also to feel that, as soon as either of these is disturbed, every effort should be made to improve her milk secretion both by correcting her diet (53) and regulating her exercise so that she can secrete a better quality and the child be again made comfortable and gain weight. If she fail by these methods to correct the error, she should immediately consider the propriety and necessity of weaning the infant while it is yet strong and vigorous.

39. In the early weeks of many children's lives, the mother's milk is nutritious and strong, giving rapid growth during that period; but it often carries an irritable element also which continually causes colic and diarrheal disturbances. As the weeks pass by, this element in the mother's milk usually increases, while, at the same time, the nutritive qualities are decreased. In this way, the apparently healthy, vigorous, strong child passes into the pale, sickly, emaciated one and an early change of diet is the only prevention of this condition (84). This character of milk commonly appears with mothers who show no evidence of ill health in themselves, but remain strong and vigorous and may have several children, some of whom they were able to nurse. On the other hand, it appears that some

mothers always become fleshy and strong while nursing, taking to their own bodies that nutrition which good nursing mothers give to their infants while they remain in a thin but healthy condition.

40. This change in the character of milk, secreted thus early in these cases, is very nearly the same condition that occurs in almost every mother when she reaches that time in her nursing period when nature indicates that she should cease nursing her infant. This is nearly always coincident with the return of the menstrual function.

#### IRRITATING BUT GOOD HUMAN MILK

41. Many mothers secrete a good, rich, nourishing milk, but one which is very difficult to digest. The infants of these mothers nearly always thrive well, grow fat and strong, but are continually colicky, cross, restless and difficult to care for. The stools of these infants are always frequent in number, yellow, with some mixture of green, mucous and undigested food (81).

42. The error lies mostly in the amount of food which these children receive or in the diet of the mother. Such infants act better when restricted in the amount they nurse. Mothers should be instructed in these cases to nurse only a short time, so that the infant will not receive more food than it can comfortably digest. Very commonly, it is necessary to restrict her nursing to three, four or five minutes actual time measured by the clock. Where a mother is careful thus to limit the time in which she allows the infant to nurse, she usually finds the uncomfortable symptoms of indigestion manifested by the infant lessened or entirely removed. Where this does not give the desired relief, she should pay very close attention to her own diet, lessening the amount of meat, milk and eggs which she consumes,



avoiding all fruits, cabbage and tomatoes and probably lessening the whole amount of food which she takes (54).

43. Irregular feeding also on the part of the mother, either in the quality of the food or the quantity taken at any meal, tends to produce distress in the infant. These infants are always demanding more meals at night than they are able to digest. This craving for extra food is the usual condition of all infants suffering from digestive disturbances. Where these changes in the food do not make the infant comfortable, ten to twelve drops of saccharated pepsin before each meal will, very commonly, improve the digestion of this difficult milk and make the child much more comfortable and thrive very much better (152).

#### NURSING MOTHERS

44. Mothers vary in their nursing capacity. Some secrete enough milk to feed their infants entirely during the first six to eight months of their lives. Some can nurse and continue to give good nourishing milk until the infant is a year old; but no mother should try to nurse her child when it is beyond that age, unless the year ends in the hot summer months.

45. Nursing mothers may be divided into two classes:

First—Those who can nurse perfectly.

Second—Those who are able to nurse their infants, but do it imperfectly.

The first class may be sub-divided very largely, according to the length of time they can nurse. Some mothers can nurse their infants successfully for only one, two or three months, and others, who may be classed as the most successful ones, can nurse perfectly from six months to a year. It is evident from this that the length of successful nursing power varies from a few weeks to a year.



The second class are those whose milk may or may not be abundant in quantity but is imperfect in quality and always produces injurious influences and bad results upon the infant. Their infants grow very little and imperfectly, or even waste away, steadily becoming smaller. These cases are considered under the head of injurious milk (35-40).

46. A mother who can nurse her child successfully should always do so, even though it may impose heavy duties upon her, or may compel her to endure pain resulting from sore nipples for weeks, if necessary, in order that she may reach that very desirable success which is always obtained by feeding healthy human milk (76).

47. The mother who cannot nurse successfully, but who is amply able to pay for a wet-nurse to do it for her, should always, if possible, prefer a wet-nurse to hand-feeding.

#### INSUFFICIENT HUMAN MILK

48. It often happens that an infant is cross, restless and unable to sleep on account of the scanty amount of the mother's milk. In this case, a baby always loses weight and becomes pale or the weight becomes stationary, and it is peevish and fretful after being nursed, sleeping poorly, waking frequently and sucking its hands (345). This infant usually has very small, infrequent stools, but they are perfect in character. In this case, the child is suffering from hunger, and on that account cannot sleep continuously. Infants acting in this way should be fed immediately after nursing with a solution of sugar-water (407) and cream. If it takes this food greedily, it is proof of the shortage in the milk supply and will demand better care of the mother to enable her to secrete a larger amount (54).

Other proofs of insufficient milk is when the child grasps the nipple and lets go frequently or continues to nurse twenty to thirty minutes. These cases will also demand substitute feeding in addition to the nursing (95). Where the stools are of a green and mucous character, it may be necessary to feed entirely; but such cases should always be referred to a physician for direction, as these stools show a serious error in the food or in the child.

### POOR HUMAN MILK

49. Many a mother is distressed on account of the restless, cross, crying condition of her infant during the first few weeks of its life. Where this condition is accompanied by frequent green and mucous stools, the disturbance in the infant is usually due to the imperfect quality of the mother's milk. This is always increased when she is taking a laxative to move her bowels or medicine of any kind whatsoever (57). Where she suffers from any feverish condition, where she loses her sleep from any cause, where she is worried and tired out in caring for the baby herself, where she is feeding very heavily on meat, milk and eggs, and particularly where she is suffering from indigestion, it is necessary that these conditions be removed before it is possible for the infant's stools to become yellow in color, of a pasty consistence and free from mucus, as healthy nursing stools should always be (52).

### FOOD OF THE MOTHER

50. Nursing mothers usually require to avoid certain articles in their diet in order to secrete a healthy nourishing milk which is not difficult to digest or liable to cause colic or other disturbances in the infant. As there is a great difference in the digestive power of infants—some being able to

digest milk from almost any mother and others experiencing a difficulty in digesting the most suitable milk—so will it be possible for a mother to take almost every kind of food when her infant has this strong digestive power.

51. The mother whose child has weak digestive organs requires to be intensely careful in selecting her food and the amounts thereof.

52. Again, many mothers have weak digestive organs themselves and can, with difficulty, digest enough food to nourish themselves and their infants. A mother who thus suffers from indigestion herself requires to pay close attention to her own diet, selecting only those foods that she can digest most comfortably so long as they procure good, healthy milk for the infant.

53. These mothers and those whose children are colicky and cross require to avoid everything that is raw and sour and large amounts of cold drinks. This excludes tart fruits, raw or cooked, also pickles, tomatoes and cabbage. In addition, mothers will usually find that free indulgence in animal foods—meat, milk and eggs—is likely to make a cross, colicky infant.

54. Regularity in the mother's diet, exercise and rest, are absolutely necessary to secure a good nutritious food for the infant. While there are many mothers who are able to do heavy labor, eat any kind of food and grow healthy children at the same time, they become no law or rule for mothers with weaker digestive powers and more delicate children, and great damage is often done through advice suggested by these vigorous mothers to young mothers with their first babies, by inducing them to eat all kinds of food, and frequently, in amounts which will be in excess of their digestive power, thus sickening the mothers and damaging

the infants. Her own good digestion and the happy, comfortable condition of the infant must always be the mother's guide in selecting the kind and amount of her food (42).

#### DRINKING MILK TO MAKE MILK

55. There is a common idea prevalent among mothers that to make milk it is desirable to drink milk in large quantities. This is an error frequently made and many use it as a drink instead of water for this purpose. A mother should remember that milk is a food as well as a drink, and that if she takes it in large amounts she will produce biliousness and indigestion in herself. Aside from this effect upon the mother, it makes her milk very difficult to digest and usually causes colic with mucous and yellowish-green stools in the infant.

56. Where it is necessary to take drinks in large quantities or beyond the usual amount in order to secrete the full quantity of milk necessary for the nourishment of the infant, the mother should always select a weak tea or thin gruel well boiled. These may be flavored only with the amount of milk or cream necessary to make them palatable. The gruel should not be made so as to be a meal more than a drink, for if it is made richer than a drink it will surely cause indigestion in herself and thus reduce the amount of milk she secretes. Beer and extract of malt are used for this purpose also, but they do not equal the gruels in the nourishing qualities of the milk they produce.

#### MOTHERS TAKING MEDICINE WHILE NURSING

57. There are very few medicines which are allowable for a mother while nursing her infant. It is an exception where she can take medicine and, at the same time, have a comfortable, happy and healthy infant. The rule is that all

medicines act upon the child with greater force than upon the mother. Opiates taken by the mother produce a very heavy, sleepy effect upon the infant and also cause constipation. Laxatives, when taken by the mother, act very vigorously upon the child, producing indigestion, colic and loose mucous stools. Nearly all tonics, and especially preparations of iron, cause griping and colic in the infant with some looseness of the bowels and disturbed sleep.

58. As the above three classes of medicine are the ones principally taken by the mother and they produce these injurious influences in the infant, it is apparent that, for successful, happy infants, all medications of the above kinds must be entirely avoided.

59. Constipation, of any degree, in the mother, should always be overcome by judicious diet and the use of hot water enemas, as these cause no disturbance in her milk secretion and consequently produce no injurious influences in the infant.

60. Where a mother is in poor health herself, it is impossible for her to give as good a quality of milk as she could if she was entirely well. It may be necessary, while she is in this condition, to receive medicinal treatment. While thus sick, she must be guided entirely by the directions of her physician. It is very commonly necessary, in short sicknesses, that she take such medicines as are needed in order to improve her health and retain a good milk secretion. Though the infant may be disturbed by this treatment, it is requisite to continue it for such a length of time as is necessary for her cure. Where the treatment has to be continued for a long time and the infant's digestion is seriously disturbed thereby, it becomes a question whether the child should not be entirely weaned. Certainly, when the infant

is making no progress physically, but, on the contrary, is daily becoming paler and its flesh softer, the situation presents great doubt as to the propriety of continuing the nursing (100).

61. Acute sicknesses on the part of the mother, when not accompanied by any serious infection of her blood, such as is present in typhoid fever, puerperal fever, scarlet fever, etc., do not necessitate the weaning of the infant as long as she continues to secrete enough milk to partly nourish it, especially when this acute sickness does not last more than a week or ten days. Usually, in these short sicknesses, the ability of the mother to continue secreting a fair amount of milk is a satisfactory guide in nursing the infant so long as it does not show serious disturbances in its digestive organs, sleeps well and retains its healthy appearance.

62. While the above rules are generally the guide on this subject of nursing during sickness, this question is always of such great importance that it must be under the guidance of the physician in charge.

## CHAPTER III

### CONDITION OF THE NURSING MOTHER

63. The young mother is frequently confronted during the first few weeks after the child's birth with very great difficulty in nursing her infant on account of the soreness of the nipples or the much more painful and aggravating condition resulting therefrom, viz., a suppurating or bealing breast. The difficulties she thus encounters very frequently decide the question of weaning or continued nursing. The future of the infant is too frequently lost sight of for the time being, and it is forced to commence fighting the battle of life on foreign food long before its digestive organs are designed by nature to take care of such food, and often long before the mother has any conception of the great uncertainties which always accompany hand-feeding of such a young infant, if not properly done. Certainly, to the mother or nurse who has had no experience in this important duty, this subject is sure to present great difficulties and to result in a very improperly nourished infant with liability to death, itself, in weak or delicate infants.

64. Where both breasts suppurate and contain pus, it becomes necessary to wean the infant. In this condition, the mother has no choice. This is a very painful and undesirable result, which can usually be obviated entirely by the proper disinfection and care of the nipples from the beginning, after each time the infant nurses (72).

### SORE NIPPLES

65. Different factors contribute to the production of sore nipples in the nursing mother :



1st. Natural formation, such as shortness of the nipple and the thickness thereof.

2d. Tender skin of some women.

3d. Wrong habits in nursing—nursing too long.

4th. Shortage of milk.

66. Short nipples are due to the length of the milk ducts. Young women, during their first pregnancy, should be aware of the liability to sore nipples when first commencing to nurse. They should make it a habit of regularly elongating the nipples by pulling upon them during the last three or four months of the pregnant period. Where they are naturally short and this is not done, as soon as the breast swells up with the first rush of milk, the short nipple does not stretch sufficiently to rise above the surrounding structures, but, on the contrary, remains so buried that, in many cases, it is impossible for the infant to grasp it. The result is that the milk cannot be drawn from the breast, or if it is drawn by the infant, there is so much strain upon the nipple in the effort to grasp it that it soon becomes very sore and the pain of nursing cannot be endured. This induces the mother, in many instances, to wean the child and condemn it to artificial feeding while she has an abundance of milk which cannot be obtained except by a breast-pump (78). Constant use of the breast-pump in these cases very soon stops the secretion, as no woman can continue to secrete her milk regularly when it is drawn away only by artificial means. It is absolutely necessary, for a continued milk secretion, to have the infant nurse the breast directly.

67. The strength of the outer layer of the skin varies very greatly in different women. Even when the nipple is well formed and of abundant size, many mothers suffer great tortures from the abraded condition of them after the



first few days' nursing. This is due to the fact that the cuticle, or outer layer of the skin, is very thin and easily injured, and where such women are not careful to nurse as little as possible and have long intervals between nursings, they soon find this work very painful indeed.

68. Nipples that are very sore should not be used so frequently; in other words, the infant may be partly fed and partly nursed, thus allowing the mother a longer rest between nursings, and, consequently, better prospect of healing these sore, tender parts.

69. Many a mother with well-formed nipples and good, healthy skin suffers from sore nipples, because she allows the child to nurse much longer than is necessary. This mother usually goes to sleep while the child is nursing at night, and by allowing the infant to hold the nipple in its mouth while sleeping, so softens the skin by the moisture of the child's mouth, that it soon becomes sore.

70. Long nursing, when there is not enough milk in the breast to satisfy the child, very commonly causes sore nipples.

#### TREATING SORE NIPPLES

71. In order to prevent sore nipples, some of the difficulties above enumerated can be avoided. In addition, the mother should, during the last two months of her pregnancy, massage and rub the skin thoroughly over the nipples when it is in a wet condition. By doing this regularly, she treats the nipples as nearly like what the child will do as possible. It is not sufficient to rub the nipples while they are dry, nor is it right to apply alum water, alcohol or other applications of a character entirely dissimilar to the moistures which the child supplies when nursing; in fact, the nearest approach which a woman can do is to moisten the

nipples thoroughly with her own saliva or cow's milk, and apply the friction and massage while in this moist condition. If she does this faithfully and continually during the two months prior to her accouchement, there is not much likelihood of well-formed nipples becoming very sore when the child nurses (66).

72. Great stress is laid, at present, upon the necessity of using disinfectants, such as solutions of boric acid, on the nipples immediately after nursing. This is a valuable practice, but it is possible to bathe them too freely during the early nursing period, and thus cause irritation. Where they are sore, bathing with boric acid water (one teaspoonful to a cup of water) after each nursing, disinfects the sore skin and thus prevents absorption of poisonous matter which would cause suppuration or bealing of the breasts (63).

73. A mother suffering from sore nipples complains a great deal of the pain and irritation caused by the contact with her clothes in the intervals between nursings. Many use oiled cloths to relieve this irritation and prevent their clothes from sticking to the sores on the nipples. This contact with clothes can be avoided by making little pasteboard cones, which are placed upon the breasts after nursing and thus hold the clothes entirely away from the sore parts.

74. These pasteboard cones are very simple and are easily made as follows: A round piece of pasteboard, six inches in diameter, is all that is needed. Cut a hole in the center as big as your finger and then cut from that to the outside edge. These two edges thus made can be overlapped enough to make the necessary height of cone and are then stitched together. These cones give great comfort to the mother, avoid the clothes crowding the nipples down

into the breasts, allow soothing dressings to remain in contact continuously, and materially hasten the process of healing.

75. Reversing the position of the infant during the nursing period so as to make it grasp the nipple on the healthy sides thereof, rather than on the sore sides, will frequently assist very much in the process of healing. In this way, the child's feet will be held under the right arm while nursing from the right breast and the same relative position will be assumed while nursing on the left side.

76. While nursing a sore nipple is very painful to the mother and hard to endure, yet, compared with that mental anguish, worry, loss of sleep and anxiety always accompanying the care of an improperly fed infant, it is very small indeed. All sore nipples finally become well, under careful handling and good treatment (46).

#### THE NIPPLE SHIELD

77. Where nipples are intensely sore and great pain results therefrom, the nipple shield generally gives decided relief and enables the mother to continue nursing when she would be compelled to wean the child entirely if she did not have some protection of this kind.

Different forms of nipple shields are used. One is the thin rubber one, which has a broad flange covering the breast, thus enabling the mother to hold it in position while the infant is nursing. The other is a glass one, with flange, which is applied over the tender part and finishes with a small rubber nipple for the child to grasp. Either one of these makes a very good application to save the mother pain and suffering, but both are very poor substitutes and, frequently, infants refuse to use them. Great care must

be taken in keeping these nipples thoroughly clean and disinfected (361).

### THE BREAST-PUMP

78. Occasionally, it is necessary to use a breast-pump where nipples are so short or so sore that it is impossible for the child to nurse. With some mothers, this is very successfully done. With others, it is an impossibility. The most suitable form of breast-pump is that with a glass body and rubber bulb. Beneath this body, there is a cup blown in the glass which receives the milk as fast as it comes from the breast. The ordinary form of breast-pump requires to be emptied and reapplied every time it fails to draw. The improved breast-pump has a valve in the rubber neck which enables the bulb to be worked more or less continuously and thus increases the suction power upon the breast. As the rubber very soon becomes old and hard, it leaks air where it is applied over the glass. It is necessary to watch this point and keep it close by tying a string tightly around it.

## CHAPTER IV

### NURSING INFANTS

79. All nursing infants may be divided into two classes:

1st. Those who are perfectly nourished, comfortable, happy and make weight rapidly and regularly.

2d. Those who are imperfectly nourished.

80. These children of the first class always yield stools that are yellow in color and of a pasty consistence, from three to six in number daily, during the first month, gradually lessening to one or two daily as they grow older.

81. There is another class of those perfectly nourished infants who continue to thrive regularly, but who suffer a great deal from colic and disturbed sleep and yield numerous stools, orange-yellow in color, frequently mixed with green, and at times, curds. The mothers of this class either nurse them too freely and too frequently, or eat food themselves which gives this green, slimy character. This is the class of children which has left the wrong impression upon mothers, giving them the idea that the colicky child is the healthy one. It is also this class which raised the idea that an infant must have a three-months' colic. The mothers of these children secrete a good, strong, healthy milk, but they lack the necessary discretion in their own diet or exercise, nurse irregularly or too freely, and thus destroy the happy and comfortable condition of the infant. These are the mothers who can, most generally, so regulate their own condition and management of the infant as to make it thrive successfully (42).

82. Imperfectly nourished infants are those who cannot be made comfortable and happy, or gain weight steadily

without additional food, and are treated under the head of "Nursing Infants Requiring Additional Food" (87-98).

### REGULARITY IN NURSING

83. Regularity in feeding an infant is necessary for its successful growth and happiness. The new-born infant should be fed about every hour and a half during the first month and about every two hours during the second and third months. The time may be extended to three and a half hours, as the infant grows older and shows an ability to go a longer time without becoming hungry. This regularity in hours applies only to the daytime. Infants should always be allowed to sleep as long as they will during the night. Many mothers make serious mistakes by feeding at irregular intervals, or whenever the child cries for it. In this way, the infant is often fed every half hour because it cries from any cause, or it may not be fed for three hours because it is sleeping. There is no reason for this irregularity in a healthy child. Where an infant is always nursed because it cries or is cross, it remains cross and colicky simply because this irregularity in feeding overloads the digestive tract, and thus causes decomposition rather than digestion of the food, and this perpetuates the cross condition of the child. Many mothers, feeding in this irregular way, so imperfectly nourish their infants that they are, in time, compelled to wean them entirely.

84. An infant should not be allowed to sleep in the daytime and be wakeful at night. Great care should always be taken by the mother to avoid the child's habit of thus converting night into day. At nearly the regular feeding time, the infant should be taken up and nursed during the day, whether asleep or awake. Only in this way, by regular day

feeding, can the child receive enough food and be well enough nourished to enable it to sleep steadily during the night. No healthy infant should nurse more than three times during the night, and only very young infants require this number of night feedings. Older infants, when well fed in daytime with good nutritious food, will not require more than one, or at most, two meals between 6 P. M. and 6 A. M. the next day. Many infants, when properly fed, receive no food after being put to bed. This will mostly occur with infants after they are five or six months old.

#### LENGTH OF TIME FOR NURSING

85. The length of time infants should nurse varies with the condition of the mothers and also with the condition of the children. The milk ducts in the human breast vary in size in different women, and occasionally, in different breasts of the same women. Where they are large and the milk supply is abundant, an infant can usually obtain a full meal in from four to five minutes. Where these ducts are small, it will require twelve to fifteen minutes to satisfy the infant. Where a healthy child continues to nurse longer than the usual time, it is generally due to a deficiency in the milk secretion. Infants who nurse from twenty to thirty minutes are getting very little nourishment. Such children, when this length of time is a habit, are always poorly nourished, colicky and cross. Mothers should remember that, where the child nurses an unusual length of time, it is more likely due to a deficiency in the milk secretion than to the infant's extraordinary appetite (48).

#### OVERFEEDING NURSING INFANTS

86. Mothers having a large supply of milk are very much inclined to overfeed their infants when this milk is



of good quality. Usually, this is not attended with any serious injury to the infant, but it causes an extraordinary drain upon the mother's strength. Some mothers have such an abundance of milk that they purposely cause the child to nurse freely, as in that way they are relieved of the strain and tightness upon their breasts and the child very easily dislodges this extra load by vomiting; but, in doing this, they fall into the habit of nursing their infants whenever they feel uncomfortable. Very little can be said against this habit, save the fact that the mother is thus debilitated and there is danger of producing indigestion in the child; but, where the milk is perfect, healthy infants are seldom damaged in this way if they vomit immediately after nursing, for nature has provided the infant with power to reduce the meal by vomiting the surplus food almost immediately after it is taken. This act of vomiting on the part of the child is not accompanied by nausea or other disturbances. Except for the soiling of its clothes, the infant suffers no annoyance from this unnecessary use of its digestive organs. Where it does not vomit, the surplus food passes into the intestine and causes colic, with mixed green and yellow gassy stools.

#### NURSING INFANTS REQUIRING ADDITIONAL FOOD

87. Many mothers cannot continue to nurse their infants successfully without the addition of some one of the elementary foods that are found in milk. If this addition is not made early, while the child is yet thriving and its digestive organs are in a healthy condition, it will soon reach a point where its mother's milk becomes so irritating to the digestive glands that they lose their power to secrete the quantity of digestive fluid necessary for the daily nourishment and growth of the infant. These infants always show



foul, mucous, many colored stools. When the irritation reaches this point, it becomes a very difficult matter to digest that amount of fat, sugar and proteid needed for successful growth and development. This mistake is commonly perpetuated in these cases too long, before the diet is properly adjusted, and so cripples and injures the infant's digestive power that it always requires very low feeding for many weeks and even months, in some cases, to again place the child in a good growing condition. It never does become the healthy, vigorous infant which nature promised in the first place and which would have been the result, if the mother's milk had been of the proper quality or the additional food had been properly substituted at the right time (37).

88. Where these corrections are delayed too long, the digestive glands are so damaged that the child continues to pine away, resulting in malnutrition, marasmus and perhaps death. Such are some of the cases which always die during the coming heated term with the first light attack of diarrhea (93).

89. These children may be divided most easily by the character of their stools, as follows:

1st. Those with yellowish, brown, or orange, watery stools which penetrate the diapers, but which leave little or no substance on the surface thereof.

2d. Those with soft stools of a pale yellow color, containing mucus and almost entirely covering the surface of the diaper.

3d. Those with mixed green or yellow colored stools, carrying mucus or slime and dotted all through with little yellowish particles of stool, which look like curds. Some say children of this class leave a fairly formed stool, or

parts of the stool will be fairly formed, pale yellow in color and the balance of mixed characters, as above described.

90. All these children with imperfect stools are cross and colicky, requiring constant attention and sleeping poorly.

91. These infants of the first and second classes usually thrive well and make weight regularly during the first few months of their lives, but they soon reach a point where they cease to gain weight until they are weaned or a food suitable to their digestion has been partly substituted. While they are making weight, their digestive glands are being irritated and gradually damaged so that there will, in a few weeks, be very great difficulty in adjusting a food suitable to their decreased digestive power which will be sufficient to secure steady and satisfactory progress after weaning (37).

92. Those of the third class, above described, seldom thrive or make weight satisfactorily. They always look pale, thin and white and also present the appearance of being partly starved; in fact, this partly starved appearance is very commonly the condition of children whose mothers are never able to give them a sufficient quantity of any kind of milk and they usually nurse them from twenty to thirty minutes, there not being enough milk in the breast to satisfy them in the usual five or ten minutes requisite for nursing from the healthy, good-secreting breast (48). The mothers of this class of children usually become fat themselves, but many of them are in poor health or are overworked, worried, tired out and should have assistance in their duties before they can nourish their infants properly. Should they fail to produce healthy stools in their infants after receiving this requisite assistance and rest, they should at

once give nourishing additional food to the infant, and failing still after this effort to produce healthy stools, entire weaning should be considered necessary (98).

93. In all these cases of imperfect nutrition, it is well to commence with the additional or supplementary foods as soon as the stools show the unhealthy characters above described. A great error occurs when the children are allowed to continue, exclusively, on a dietary which shows other results than the correct ones indicated by the healthy yellow stool. Parents may feel sure that the infant's digestive glands are being gradually damaged and injured even while they, apparently, are healthy and growing rapidly. When the stools show these unhealthy characters, through neglect to correct these errors at the proper time, the foundation of future indigestion, loss of weight, colic, crossness, diarrhea, and many other conditions of malnutrition is laid (88).

94. As these nursing infants are only consuming the sugar, fat and proteid supplied by the mother, it is easy to see that the error lies in the character of some one of those elements she secretes. To correct this error, sugar, fat or proteid from cow's milk should be substituted in small quantities two or three times each day until correct evidence of such substitution is noted upon the stools (104).

95. As the stools in these cases are usually too frequent, it is seldom desirable to commence with fat, which is relaxing in its effects, but rather select that element which is constipating. Skim-milk diluted with about five times as much boiled water and slightly sweetened to improve its taste should be fed. The amount of this skim-milk must not be more than one to three ounces daily, diluted with water, during the first month. This should be given in four meals, giving one ounce at each meal. An infant two months

old may take four to six ounces of skim-milk daily, diluted with water and sweetened. An infant of three months, from six to eight ounces thus diluted. This food may be given in smaller quantities before each nursing or given in the above amounts as substitute meals. The latter plan is generally the easier and more satisfactory. It should be fed alternately with the nursing meals. The exact amount which may be fed must always be governed by the happier condition of the child and the healthier condition of the stools; in fact, the character of the stools is the only true and safe guide, as it gives you direct proof each day of success or failure and whether the digestive glands are being irritated by the character of the food they are called upon to digest.

96. Should the skim-milk cause too much constipation, show curds or an extra gassy condition, it would be requisite to partly substitute whey for it (395), or increase the amount of sugar gradually, being guided by the softness of the stools (243). Cream and skim-milk in these cases must generally be pasteurized and peptonized also, to secure easy digestion.

97. In the feeding of either of these elements—proteid or fat—it is not necessary that the proportion of seven per cent. milk-sugar be always maintained in the dilution of them. More may be used for some infants. In cases with very watery stools, sugar often increases this trouble. If the sugar is not provided for in this way, a starch substitute must be used or the child's nutrition will not be perfect. The mother must always remember that, in nature's plan, sugar forms over half of the food in the infant's dietary and a reduction of this food cannot result in anything but the child's imperfect growth, pale countenance, unhappy con-

dition and poor nutrition if starch, or another sugar is not substituted for it (407).

98. From the above conditions and evidences of improved results by a perfectly digested additional food, the mother must realize the absolute necessity of only nursing the child when she produces these healthy formed stools. Her own maternal desire and love of the work must be entirely subject to the child's future success. She does not wish to do otherwise, but the great difficulty is in making mothers realize, while nursing their infants, no matter what their age, that in order to secure the future success of the child, they must be guided by the present evidences of success or failure given daily by changes in weight and those proofs which the stools present regularly in their general characters. No more should she disregard these evidences, as daily presented to her, than disregard the evidences of incorrect work, when her preserved fruit ferments, her bread turns sour or her cakes fail to rise in the making. In all these cases, she knows an error lies in her work. With her nursing infants, she must, immediately, look at failure of increasing weight and unhealthy stools as due to an error, but one of such an immensely greater magnitude that it demands serious thought and prompt correction much more than those little errors above cited in her culinary work (89).

#### IMPERFECT NURSING WHICH DEMANDS HAND-FEEDING

99. Where a nursing infant is unhappy and does not thrive well, this result is caused by an insufficient amount of suitable mother's milk or by the indigestible character thereof. Where the mother's milk is suitable in character, but insufficient in amount, the child is cross and pale, but

is free from gassy discharges, and has healthy stools, small in size (48). This infant can continue to nurse by having additional food, as per feeding schedules (573-579).

100. The digestive glands of the infant, with continuously green, foul, slimy stools, are being seriously injured and future success demands that it be weaned entirely and fed according to the feeding schedules.

101. The difficulties in changing food, the damage done to the infant's digestive glands and the mortality are increased in direct proportion to the length of time the infant has been showing these green, slimy, foul stools (89).

102. In selecting the amount of food, the weight of the infant must be the guide, and meals one-third smaller than those in the schedules should at first be tried. Where the proportions in one schedule do not seem to give a healthy stool and make the child happy, those in another should be tried, always using that one which makes the child comfortable and gives not more than two healthy, well-formed stools each day (294, 441).

103. As these infants, who demand immediate weaning, have always been damaged in proportion to the length of time they have been passing those unhealthy stools, they will, usually, lose weight for some time on the new food. This occurs until healthy stools are produced, as a sure foundation for success. When these have been found, the same proportion of foods can be increased carefully, as long as the stools remain perfect and the child shows a regular advance in weight. These changes often require two to four months in the badly damaged, but where the weaning is done in a week or two after the unhealthy stools appear, only a few days or weeks, usually, are needed to find the correct proportion of foods for the new dietary (228). It

is in this class of infants that the greatest damage is done and the greatest mortality follows (184).

104. Infants under three months old who demand weaning will be able to take very little starch while being weaned; consequently, they must be fed with the fat, proteid and sugar in cow's milk. For such cases as these, those parts of the schedules which contain no starch are most likely to be suitable. Small feedings from the schedules should be given and alternated with the nursings before the child is weaned (95). Where this is successful, parts of the stools will show characteristics of the new food and the rest characteristics of the mother's milk. As soon as the new food gives the healthy stool, the infant should be weaned entirely, and all the nourishment given should be in small meals from the schedules (573-579).

105. If the infants are over three months old when weaning is demanded; it is generally found that the new dietary should carry a fair proportion of starch. The reason for this is that the fat, sugar or proteid in the mother's milk has damaged the digestive power of the infant, and it is better to go, partly, to an entirely new food and thus rest those injured parts. For these cases, those parts of the schedules carrying starch are more successful, but the fat, sugar and proteid must be fed in small proportions with the starch. It is always best to commence the new food by adding only one of these articles to the starch, making further additions when healthy, well-digested stools allow this to be done (303).

#### SUDDEN WEANING

106. Many mothers make serious mistakes in deciding to wean their infants suddenly. This should never be done except in extreme cases, where the child's life is in danger



and the physician directs her to do so. Digestive troubles of very serious characters are sure to follow sudden weaning at any age, unless the child is fed in very small amounts, until the new foods show perfect digestion. Under any plan, sudden weaning means serious loss of weight in the infant. This is due to the sickness following hasty weaning when improperly done, or due to the very limited dietary which can be given with safety at this time. Rather than wean an infant before it has reached an age where it is able to digest liberal diet, it is always preferable to gradually substitute the mother's milk with meals of the new food, if by doing so the infant is made happy and the stools show good digestive results (87-98).



## CHAPTER V

### COW'S MILK FOODS

107. This subject presents difficulties of various kinds, according to the location, whether in city, village or country. The general understanding at the present day is that suitable milk is only that taken from the herd, or many cows, rather than from one cow. On the principle that if you make a mistake in selecting milk, it is better to make a small one than a large one, the method of taking herd milk rather than from the individual cow, is correct. In a city, milk is usually sold from the herd and not from the individual cow; consequently, experience in feeding infants in a city is almost entirely confined to herd milk, from sixteen to twenty-four hours old when delivered.

108. There are objections, however, which can be raised to each and every way of selecting the milk supply. Perhaps the way open to the least objections is to take fresh milk from the individual cow, when trial shows that her milk is suitable and her food and care are entirely under intelligent control. This method is applicable either in the city or country, for those who are able to bear the expense of keeping their own cow; but where the milk has to be bought, the proper selection thereof must depend upon the intelligence and industry used in judging a suitable milk and in looking into the care and cleanliness of the milk dealer.

109. Milk, to the ordinary observer, requires little thought or attention. In homes where there are no children

or invalids, almost any kind of milk that measures full quantity and is not sour passes as a first-class article, and is indorsed by the consumer as being perfectly reliable. The small amounts which adults consume, if they do not drink it as a food, are nearly always sterilized when added to tea or coffee or cooked into sauces, puddings, etc.; consequently, milk taken in this way never produces any unpleasant results. It is only the tender stomach of the infant or invalid, which is called upon to digest milk in large quantities, that is able to detect impurities or unsuitable proportions therein (149).

110. There is a great difference in the actual quality of milk, not only in the amount of the ingredients therein, but in the character of those ingredients also. How can it be otherwise? The dairyman will point out the great difference in the value of different animals in his herd, according to the amount of butter or fat which the milk carries and the amount of milk secreted daily.

111. All milk should be as fresh as possible, but older milk may be used in cold weather and also in warm weather if kept continuously upon ice from the time it is drawn (564). It is not damaged by being frozen, so long as it has never been exposed to enough heat to allow it to thaw and the souring process to occur. This applies to the milk of the herd or the milk of the single cow.

112. Great claims are made by all dealers regarding the quality of their milk and its suitability for infantile feeding; but if the infant's digestion of it does not give comfortable results, it should be discarded and another milk tried. No milk is suitable if the cows are fed on brewery grains or waste products from a distillery or factory of any kind, and the fresh spring grass nearly always disturbs the quality of

milk for a week or two after the cows are first allowed to feed upon it.

## COW'S MILK

113. As the health of the infant, perhaps even its life, depends upon the quality of the cow's milk upon which it is fed, it becomes very important that the selection of the cow, together with the food and care of the animal, should be carefully considered before commencing to feed its milk to the infant.

114. As these animals are exposed to the inclemency of the weather at different seasons of the year, it is always desirable to select one of a strong, hardy nature and of a quiet disposition. Just as children are sickened by the disturbances in the health of the mother, so will they be sickened by the disturbances in the health of a cow which feeds them.

115. Cows which usually give very rich milk are not so well suited for infantile feeding. This will exclude Jersey cattle, many thoroughbred animals and those which have not been born and raised in that climate (571). Usually, the Holstein, Ayrshire and common-grade cows are vigorous, healthy, strong stock, and secrete a milk suitable for infantile feeding.

116. Experience shows that cows, when stabled and fed a fixed ration of clover hay with a moderate amount of bran and middlings, give a more equable and suitable quality of milk than do these same animals during the summer season, when they are allowed to roam the fields and feed upon variable kinds of grass which appear during the wet and dry weathers, from early spring until the late fall. Extraordinary amounts of green food, such as corn, young oats and very fresh grass, make a laxative and colicky quality of

milk. It matters not whether dry feeding be done in winter or summer, the result is always better than when the cows are allowed to roam upon pasture fields.

117. Milking should be done in a clean room and not in a foul, dirty stable. The udder should be thoroughly brushed before milking and the hands of the milkman, also, thoroughly cleansed. Milk should be drawn into a clean pail covered with two or three layers of cheese cloth, so that no particles of dirt can fall therein. In this way, all dirt will be strained out while passing through the cloth. As the milk ducts always contain some bacteria, the first few streams, which contain them, should be thrown aside. This reduces, very materially, the number of souring bacteria which appear in milk.

#### HOW TO SEPARATE CREAM FROM MILK

118. Great advantages are obtained in cooling milk by quickly changing it from the warm to the cold condition. The more marked and decided this change can be, the more perfectly will the cream rise to the surface. Milk, at a temperature of 60 degrees, when subjected to the influence of ice, will not throw up cream or fat as rapidly as the same milk would do if the ice were applied thereto when the temperature was at 100 degrees. It is often very much better, when wishing to hurry the separation of the cream, to warm the milk up to about 100 degrees, the natural animal heat, and then apply the ice while at this temperature. Of course, cream will always rise just in proportion to the intensity of the cold, and the warming and cooling should always be done rapidly to avoid souring changes which occur in milk at intermediate temperatures.

119. By placing milk on ice, cream, being the lighter

substance, separates from the skim-milk and rises to the surface. The rapidity with which the cream and skim-milk are separated depends upon the amount of ice which surrounds them. Where it is used in abundance and the temperature of the milk quickly reduced below 40, the cream separates in from two to four hours. Where this low temperature is not obtained, it will require from twelve to twenty-four hours, or even longer, for all the cream to rise (559).

120. By thus cooling milk, cream (fat) and skim-milk (proteids) are separated enough to answer all purposes necessary in infantile feeding.

121. It is impossible to separate all the cream by the gravity process, but usually it can be done perfectly enough to suit the digestion of any infant.

122. As all milk sours quickly when kept warm after being drawn, the milk pail should be immediately placed in cold water or the milk run over cooling pipes containing cold or ice water. As soon as the milk is cool, it should be bottled and kept on ice continually until it is fed to the infant; but where ice is not used, it will be necessary to carefully regulate the number of hours which it must stand in a cellar or other cool place before being prepared for food, in order to remove a portion, at least, of the cream (564).

123. Where cream is thus raised from milk without ice, it will be requisite to pasteurize, or even sterilize, the milk and cream, as soon as they are separated from each other, so as to destroy the bacteria, and thus prevent souring. This is always necessary in hot weather (147).

124. The fat globules in milk make a decided difference in its suitability for infantile feeding. Where those globules

are very large, they respond quickly to the influence of cold and rise to the surface in a few hours; but where they are very small and fine, they are exceedingly numerous and do not respond to the cold so rapidly. The result is that there is a great difference in the perfectness with which cream can be separated, and this causes one of the main difficulties in feeding infants. While this difference may not be of importance in feeding healthy, strong babies with good digestion, it very commonly offers a serious obstacle in feeding very delicate or damaged ones. This frequently is the case where fat cannot be digested well.

125. From the above facts, it will be seen that any method which does not separate cream entirely cannot be used for infants whose power to digest fat has been destroyed or badly impaired by overfeeding this food at some previous date. Some mothers become very expert in handling milk used for their infants by finding the number of hours which it requires to stand in a cold place, when ice is not used, in order to remove the surplus of cream which their infants cannot digest. These mothers feed the sugar solution (206) and skim-milk thus prepared, varying the digestibility of the food by the length of time the milk stands before being added to the sugar mixture. In this way, they adjust the necessary fat and proteids in fresh milk and thus secure well-digested and formed stools (560).

126. In large establishments, cream is removed from milk by separators, which do this work very rapidly and perfectly, without the aid of ice. This method secures milk and cream in the newest and freshest condition. It also removes all dirt in the milk; but this method cannot be used except on large amounts of milk.

## WHOLE MILK VS. SKIM-MILK

127. By whole milk, we mean the milk with all the cream retained in it. By skim-milk, we mean the milk left after the cream has been removed.

128. Skim-milk may contain any percentage of fat, less than the natural amount, according to its age and the temperature to which it has been exposed while standing (118). Where an abundance of ice is used and the milk chilled down after it is drawn, no souring occurs for a day or two, according to the season of the year; consequently, skim-milk thus kept is suitable for infantile food.

129. Whole milk, when well diluted, may be used for feeding some infants where they can digest the natural proportion of fat which it carries; but infants whose digestive organs have been damaged by overfeeding fat, very seldom can digest the amount of this food contained in whole milk. With these infants, it is necessary that skim-milk be used in preparing their food, and only that proportion of fat or cream added which the infant can properly digest. Many infants, who have been abused by overfeeding of cream, entirely lose the power to digest this food, but usually recover it in a few weeks, if properly fed.

## VARYING AMOUNTS OF CREAM IN MILK

130. Great variations in the strength of milk are shown by analyses of many samples of milk. The author is indebted to Tower's Wayne County Creamery, in Detroit, for the privilege of using one of their record books, showing their analyses of farm milks. This firm has, for years, kept a system of the latest milk analyses, whereby they ascertain exactly the percentages of fat every day on all milk shipped to them from several hundred farms within a short radius



of Detroit. Out of this large number, we have selected two farms which represent the highest and lowest percentages of cream on farmer's milk. By their system, Towar's Wayne County Creamery collects samples every day, and the following figures represent the monthly averages of cream from the milk thus collected. It will be seen that each sample varies continually from month to month, but each one consistently maintains its highest or lowest average, thus showing that the grade of cattle and the feeding thereof has been consistent throughout.

131. TABLE OF CREAM AVERAGES

MONTH	THE HIGHEST AVERAGE OF CREAM	THE LOWEST AVERAGE OF CREAM
January .....	4.00 per cent.	3.60 per cent.
February.....	4.10 "	3.50 "
March .....	3.80 "	3.40 "
April .....	3.90 "	2.80 "
May .....	4.00 "	3.20 "
June .....	4.00 "	3.50 "
July.....	4.30 "	3.40 "
August.....	4.20 "	3.60 "
September .....	4.00 "	3.40 "
October.....	4.10 "	3.70 "
November .....	4.50 "	3.80 "
December.....	4.70 "	3.80 "

## VARIATIONS IN THE STRENGTH OF MILK

132. This is a very important subject to thoroughly understand when using cow's milk for infantile feeding. To the kindness of Dr. Towar, of Towar's Wayne County Creamery, the author is indebted for the following chart. It shows the percentage of each food and also the total foods, or solids, and water in the milk of six cows selected out of their herd of 117 kept on their farm near Ann Arbor. This herd supplies only their certified grades of milk and is always fed on a fixed ration. At my request, he took the milk from Jersey and Holstein cows only, as



they can fairly represent the milking extremes of quantity and quality.

133.

DATE, 1904	TEMP.	TIME SINCE DRAWN, HRS.	CREAM, PER CENT	TASTE	FLAVOR	FAT, PER CENT	PROTEIDS AND SUGAR, PER CENT	TOTAL FOODS, PER CENT	WATER, PER CENT	BREED OF COW
Sept. 30 ....	60°	14	14	Normal	Good	3.30	9.00	12.30	87.70	Holstein
Oct. 11 .....	58°	14	20	Normal	Good	4.60	10.52	15.12	84.52	Jersey
Oct. 18 .....	58°	14	22	Normal	Good	5.40	10.10	15.50	84.50	Jersey
Oct. 18 .....	58°	14	12	Normal	Good	3.50	9.15	12.65	87.35	Holstein
Oct. 22 .....	58°	14	14	Normal	Good	3.50	8.70	12.20	87.80	Holstein
Oct. 22 .....		14		Normal	Good	2.40	9.00	11.40	88.60	Holstein

134. All the samples of milk used in these analyses are fourteen hours old and tested at nearly the same temperatures. The main point to be noted is the great variation that exists in the amount of the foods or total solids in the different milks. This varies from  $15\frac{1}{2}$  per cent. in the richest to  $11\frac{2}{5}$  per cent. in the weakest samples. A greater contrast is shown in the proportion of fat. This ranges from  $5\frac{2}{5}$  per cent. in the best Jersey to less than half that amount,  $2\frac{2}{5}$  per cent. in the most dilute samples of Holstein.

135. The remaining solids, which are the sugar and proteids, show a corresponding, though not so decided, variation in amount, ranging from  $10\frac{1}{2}$  per cent. in the best Jersey to  $8\frac{2}{3}$  per cent. in the weakest Holstein.

136. A glance at the water shows the greater amount which is present in poor milk. This is, of course, necessary to compensate for the reduced amount of solids.

137. When we look at the great variations in the total foods and remember that they are all the food which milk contains, we realize at once how important it is to have the same grade of milk every day when feeding an infant. We can also see how children will vary in the amount of milk they must drink daily, when they are taking different milks, in order to be equally well nourished. An infant who consumed twenty ounces daily of the best Jersey milk in the above chart would require to take nearly twenty-six ounces of the weakest Holstein each day to be as well nourished.

138. We must not conclude from the above facts that the Jersey milk is superior to the Holstein as an infantile food. The experience of most physicians who are conversant with this subject is that the Holstein milk makes

the better food; but this is not yet a settled fact. This claim is made largely on account of the greater strength, more rugged health and quieter temper of the Holstein cattle. These qualities secure a milk of a less variable quality than can usually be obtained from the more nervous and delicate Jersey.

139. While the above chart shows the Holstein milks to be much lower in food percentages than the Jersey samples, we must not conclude that this always applies. Dairywomen commonly find striking exceptions to this rule. The lesson to be learned is that the amount of milk fed to infants must vary according to the richness of the milk, as this richness always represents the amounts of fat, proteids and sugar which the milk carries.

#### MILK AS A DRINK

140. Very commonly, a mother will give her infant milk to drink when she thinks it is thirsty. This occurs at all seasons of the year, but most frequently during the summer-time. A little thought on her part should prevent her from doing this.

141. During hot weather, especially, infants become fretful and uneasy, even when they are fed regularly and given full amounts of food. This is mostly due to the heat and consequent thirst. Here is an instance where the mother unconsciously denies her infant the privilege she demands for herself—that of taking water alone, rather than meat or bread with water, when she wishes to quench her thirst.

When an infant is thirsty and cries for a drink, instead of giving it water, as the mother should do, she gives it milk, which is equal to the water she takes herself with

meat and other foods added thereto. A mother must remember that milk is not a drink alone, but it is a drink and food combined, and as she would herself be very soon sickened on a hot day by eating large amounts of solid food every time she took a drink of water, so must the little one be sickened when she insists upon its taking a drink and solid food together as it exists in milk, instead of that water alone for which it craves so much.

142. All mothers should bear in mind that they can only feed an infant the same amount of food each day, but they can increase the drink just in proportion as the increased heat of the season makes it necessary. Increased drinks never do any harm, but increased food always results in sickness, just in proportion as the food has been unduly and thoughtlessly given (279).

143. There is no cause so certain to produce sickness as unsuitable increases in the child's food, and this is always the case when milk is given as a drink. Rather than give milk as a drink to the infant on a hot day, the mother should reduce the regular amount of milk in direct proportion with the increased heat, for by doing so she will generally avoid those summer bowel disturbances which are so fatal. All adults demand less and lighter food as the hot weather approaches, and all infants require the same decrease in order to remain in good health.

#### SOURING OF MILK

144. It is necessary to keep milk on ice in order to prevent souring or fermentation of the sugar therein. This is easily done during winter weather, but in the warmer season this change occurs so rapidly that it must be either pasteurized (145) or sterilized (148), to avoid indigestion

and consequent bowel disturbances in the infant. Where this tendency shows in the child, the milk should always be boiled; bottled while hot; the meals put up separately; corked with cotton batting and placed upon ice until used. This process prevents all contact with souring bacteria after the food is prepared (209).

#### PASTEURIZATION OF MILK

145. This is a term applied to that process of heating milk which is sufficient to destroy most of the injurious bacteria therein and still preserve its natural taste. To pasteurize milk means to raise the temperature to about 170 degrees and retain it at that point from twenty to thirty minutes. There are cans for this purpose, into which a thermometer is fixed so that the temperature can be read while the work is being done. A simple way of effecting this result is to place the milk in a bottle and set it in a tin pail of cold water, deep enough to surround the milk entirely. This cold water should then be boiled for half an hour. Care should be taken to place a plate or dish underneath the bottle to prevent it from being broken by the heat.

146. This process of pasteurization may not be necessary with good healthy, clean milk in the winter season, but it is absolutely essential during the hot months of summer, as the souring bacteria in milk work so rapidly in warm weather that it is seldom safe to use milk in its raw condition at that season of the year. These souring bacteria are so antagonistic to the peptonizing process in the stomach that only very strong, healthy children are able to use milk in its raw state. Even in cold weather, particularly in cities where milk is kept a long time before being deliv-

cred to the consumer, it is frequently necessary to pasteurize it when used for infantile food.

117. As cream does not rise from pasteurized milk, it is always necessary to separate cream from skim-milk before pasteurizing both of them. Pasteurization checks the changes in the sugar. It has no effect upon the fat; but, inasmuch as the cream carries a percentage of sugar also, it is necessary that both should be pasteurized.

#### STERILIZATION OF MILK

118. This process means simply bringing the milk to a boiling point and retaining it there for twenty minutes or half an hour. As sterilization changes the taste of milk and renders it less palatable, it is, consequently, a less desirable treatment than pasteurization, though a more perfect one. Where it is inconvenient or unsuitable to pasteurize, sterilization can be adopted. The same necessity arises for separating cream from skim-milk before sterilizing as exists before pasteurizing. Sterilization may be done by putting the milk directly on the fire and boiling it, or carrying on the pasteurizing process for a time long enough to make the milk boil. The latter is the better process.

149. As there is uncertainty about the pureness in character of any milk (109), it is always desirable, when a child shows bowel disturbances, to pasteurize or sterilize it for a few days, in order to ascertain whether this difficulty in the digestion arises from changes which occur in the milk or is due to the size of the meals.

#### PEPTONIZATION OF MILK

150. As cow's milk carries a much higher percentage of casein proteid than human milk, and as this is the most difficult one to digest, infants very commonly suffer from food

fermentation or decomposition, with consequent gas, colic, disturbed sleep and loose, green, mucous stools while taking this food (281).

151. Young infants with feeble digestive power and others whose digestive glands have been damaged by over-feeding of fats, proteids or sugar are unable to digest cow's milk in proportions large enough to nourish them properly unless the proteids therein are partially predigested.

The observations and work of Drs. Van Slyke and Hart in the feeding of calves at the New York Agricultural Experiment Station have aided physicians greatly in systematizing the process of predigesting cow's milk for infantile feeding. While the changes produced on milk by rennet, acid, pepsin and pancreatin have long been known, the systematic order of using them has not been recognized hitherto, and the writer fully appreciates the benefits resulting from their clear description of the several steps necessary to follow in order to secure successful results.

152. In the digestion of proteids, nature makes three different successive changes in the stomach, and this requires three different sets of glands in that organ. The first change is affected by the rennet secretions, the second by the hydrochloric acid and the third by pepsin, and all three are necessary for perfect work.

As the amount of casein in human milk is much less than in cow's milk, it is natural that the proteid digestive secretions of the infant should be inadequate to digest cow's milk. This being the case, does it not seem reasonable, and in most cases absolutely necessary, to assist the infant in this process of digestion? The experience of the writer has convinced him that it is a mistake to put this heavy labor on the feeble digestive glands of many infants without

rendering them this assistance. Objection is raised to this digestive assistance by many physicians on the ground that predigesting milk lessens the labor of the infant's digestive organs, and, consequently, weakens them by non-use. For many years the writer believed in this principle and acted upon it and thus caused a great deal of suffering and distress amongst his patients. For the last five years, the milk fed to all infants has been predigested whenever an infant has shown inability to do this work perfectly and be happy and comfortable while so doing. Very many of these infants have been fed for several months in succession upon predigested milk and always with great benefit. There has never appeared one case which showed any decrease of subsequent digestive power on this account, but, on the contrary, all have shown greater growth, happiness and improvement from every point of view while taking predigested milk, and, invariably, they have been able, in a few weeks or months, to take stronger milk preparations and digest them perfectly without any artificial assistance.

Predigestion of milk has been commonly called peptonization. This word is a misnomer, as there is no pepsin used in the process. The pancreatin used for this peptonizing process is useless unless it is in an alkaline medium, consequently, a large amount of bicarbonate of soda is necessary to produce this alkalinity and thus render the pancreatin effective. This method ignores the work of the stomach, as the rennet, acid and pepsin work only in an acid medium, which is the natural condition of the stomach, consequently, neither lime-water nor soda can be added where rennet is used for predigesting cow's milk.

Failure to digest cow's milk in the infantile stomach may be due to a deficiency in any one of the stomach secretions



—rennet, acid or pepsin—and these secretions act in the order above named. Before deciding to pancreatize milk in the alkaline medium suitable to the upper bowel, proper efforts should be made first to artificially coagulate the milk with the rennet solution and thus digest it partly in the stomach, as nature intended. This demands that the milk be first pasteurized for half an hour in order to destroy lactic acid or souring bacteria, as pepsin will not act where many of these are present. This is done by putting pure milk (not diluted) in a bottle and setting it in cold water which must be boiled for half an hour. When this water gradually cools to  $104^{\circ}$ , the rennet should be added to the milk, still standing in the water, and also a small pinch of common salt. If there is enough rennet used, coagulation will be accomplished in a few minutes and then the whole amount should be vigorously shaken to thoroughly break up the curds. When all is thoroughly rennetized or coagulated, it can be diluted, sweetened and fed. The amount of salt needed in this solution is very small, being only enough to be tasted in the solution. This rennetized or coagulated milk can be placed upon ice and kept for subsequent meals. Care must always be taken to heat it slowly in water of about  $103^{\circ}$  to  $105^{\circ}$ , as quick heating renders the curds difficult to digest.

It must be borne in mind that this whole process of rennetizing is following nature's work in the calf's stomach, and, to be successful, it must be conducted upon nature's principles of temperature. Rennet is obtained from the calf's stomach, and a great many infants, when receiving this natural rennet assistance to digest that milk, which is intended by nature to be digested only in the stomach of that animal, will be able to finish the process successfully and

thus become happy and thrive satisfactorily, but would fail entirely to do so without this assistance. As this is the first process in the act of digestion, it should always receive a fair trial before resorting to the later process of pancreatizing the milk, as has been commonly used hitherto. Pancreatin only works below the stomach and thus entirely cuts out the work of this organ.

The amount of salt added to this solution supplies a portion of hydrochloric acid which assists the natural secretions of the stomach to dissolve these curds, and, in some cases, where it may appear necessary, small amounts of pepsin in a hydrochloric acid solution may be given to the infant after feeding to assist in digesting the rennetized curds before they pass out of the stomach. Where these agents fail in making the infant happy and grow satisfactorily, the pancreatin and bicarbonate of soda solution should be tried.

Peptonizing (pancreatizing) tubes can be procured with full instructions for doing this work from any reliable druggist.

153. Some recommend peptonizing (pancreatizing) by the cold process and others by the warm one. As milks differ according to age and quality, they sometimes present difficulties when being peptonized (pancreatized) in large quantities for the whole day's dietary. It is always best to add just sufficient pancreatin powder, mixed with sugar, for a meal before warming the milk for feeding. In this way the process commences with heating the food and continues after feeding.

154. Peptonization (pancreatizing), when carried too far, renders milk very bitter and objectionable to most infants. As this process requires body heat for its success, care should be taken to feed the milk as soon as it is warm

enough, and not allow any delay of the infant in taking it, as it will coagulate and become bitter when kept too long while being fed.

155. Where mothers try to peptonize (pancreatize) the whole amount of food for the day, they very commonly, have difficulty in preventing the process going too far. This is avoided by preparing and feeding it as above directed. When the warm process is followed and the milk boiled to check farther peptonization, the continued good effects of peptonizing are lost to the infant. The most convenient way is to have the peptonizing (pancreatizing) powder made into a mixture so that it can be added to the food when being warmed.

156. The following mixture keeps well and is convenient to use. It should be kept as cold as possible.

Pancreatin, 1 drachm; salicylate of soda, 5 grains; bicarbonate of soda, 80 grains; simple syrup, 4 ounces.

By this plan, ten to twelve drops will peptonize one ounce of milk, and enough of it should be put into each bottle before warming the food to peptonize or predigest the amount of milk which each meal contains. It can be increased when needed.

When a pancreatin mixture smells very strong and disagreeable, it shows that there is some decomposition in it and the pancreatin of some other manufacturer should be used.

#### CONDENSED MILK

157. Condensed milk is a valuable food in the following conditions: 1st—Where a reliable and pure cow's milk cannot be obtained.

2d—During hot weather, in families who have not an abundance of ice to prevent the souring of cow's milk.

3d—While traveling, in order to avoid the danger from changes in cow's milk when kept too long.

158. The addition of sugar in making condensed milk prevents all changes which are caused by age and heat on fresh milk; but the very high percentage of sugar necessarily compels the infant to receive more of this food than nature intended. This being the case, it is an impossibility to feed the full amount of proteids needed for infantile food, as the proportions of this food to the sugar is much less than is present in either human or cow's milk. Children fed in this way become very fat, white and sluggish. They present a good appearance, usually, but are generally slow in teething and walking, and have not that resistance to sickness which children enjoy who are fed upon a more natural proportion of fat, proteids and sugar.

159. In hot weather, condensed milk, very commonly, becomes valuable as a substitute for cow's milk and if not fed too liberally, will often carry a delicate infant successfully through the trying weeks of summer. One very great objection to its use is the impossibility of adding enough starches to the dietary while feeding such a high percentage of sugar. This feature prevents the changes in food necessary for the child's development until the infant is beyond the age when starch should have been introduced.

160. There is not much difference in the various brands of condensed milk. The main one is that some carry a little more sugar and fat than others. Some manufacturers remove the cream and condense the skim milk, and others make additions to condensed milk which they specify upon their labels, and upon these additions make specific claims for excellence. As with cow's milk, so it is with condensed

milk—that brand which gives healthy stools and makes the child happy is the one suitable for that particular infant.

#### EVAPORATED CREAM

161. This is a condensed milk, made by evaporating part of the water from the milk and sealing it in tin cans while hot. Manufacturers depend upon its complete sterilization to preserve it from decomposing. No sugar is added to assist in its preservation. It is unlike condensed milk, inasmuch as it is subject to the same changes as cow's milk when exposed to the air. Evaporated cream is a very valuable food where it is impossible to obtain a good reliable cow's milk, and is more valuable as a regular diet than condensed milk, as it allows the addition of starch at any age where an infant is able to digest it.

162. Both evaporated cream and condensed milk are unsuitable as a constant diet on account of the complete sterilization to which both have been exposed. Infants fed on these foods are very liable to have scurvy unless some other food, such as beef juice or orange juice, is given in addition thereto.

163. Where an infant cannot digest fat, it may be impossible to feed evaporated cream, as the fat cannot be removed from any milk which has been sterilized.

## CHAPTER VI

### SUBSTITUTE FOODS AND FEEDING

164. Many infants require hand-feeding from the day of their birth, while others may require it at any age before the natural time for weaning. This necessity is imposed upon infants under three conditions:

1st—Where a mother has no milk secretion.

2d—Where her milk, though good, is insufficient to properly nourish the child (48).

3d—Where she has an unhealthy supply that sickens the infant(48).

All these conditions are liable to occur at any time during the nursing period. It becomes necessary, then, to thoroughly understand how to adjust artificial or new food to the varying conditions of the digestive power of young infants during the first year of their lives (276).

The second and third classes are treated under "Imperfect Nursing Which Demands Hand-feeding" (99 and 573-579).

165. As the digestive glands of the young infant are continually growing more numerous and stronger, it can easily be seen that its powers of digestion are steadily increasing. This healthy change in the digestive glands to increasing capacity is always entirely dependent upon the perfect digestion of fat, proteids and sugar and the consequent successful growth and development of the child's digestive power (187).

166. In accordance with these conditions, artificial or hand-fed infants can be divided into two large classes:

The first class comprises those who have been properly fed, whose digestive glands have never been injured, whose growth and development is a continual success and who have the foundation laid for future good health, strength and probable success in life. Their diet has been similar to that shown in schedules 573-579.

The second class, and I am forced to say it is a very large one, comprises those improperly fed infants who manage to exist and grow, though imperfectly, in spite of the abuse rather than the proper use of their digestive power. The amount of damage done to these infants during the first few months of their lives depends, of course, upon the extent of errors committed in trying to feed an unsuitable diet (210).

Some are crippled in this way one-eighth, others one-quarter and others even to one-half, in time reaching that point where there are not enough healthy digestive glands left to convert the amount of nourishment needed to sustain life. These are doomed to an early death. In a large number of hand-fed infants thus crippled by dietetic abuse, we find evidence of this damage done them in their reduced growth, smaller size, large heads, deformed bodies and limbs, enlarged livers, irritable, nervous constitutions, weak kidneys, skin eruptions, poor color, lesser vitality and reduced power to resist the diseases of infancy (14-15).

167. The proper feeding of these damaged infants is, generally, a very difficult problem and can only be properly done by the experienced physician. As an assistant to the mother, and also to show the difficulties and delays involved in this intricate work, the author is preparing a separate book called, "Feeding Rules for Delicate Infants," which is devoted entirely to this class of cases. In this volume, the filled schedules show the exact food and actual progress made



by damaged infants. The great variety of these cases might call for an innumerable number of schedules, but the author has used only a sufficient number to illustrate the more frequent forms of dietary needed to correct and improve errors shown by this class of infants.

#### WOMEN SUITABLE TO DO INFANT FEEDING

168. It is not every mother, even when she is properly educated for this work, who should undertake the important duty of feeding her infant artificially. As her own rest, comfort, mental happiness and perhaps even her health may be involved in this labor, the question should always arise, Will I nurse my baby? Will I get a wet-nurse for it, or will I feed it by hand? Only those who have had experience in this work and have seen hand-feeding done by many mothers, are enabled to correctly form an opinion on this important matter.

169. Where there is no possibility of avoiding hand-feeding, the mother who has this duty imposed upon her should be most careful to thoroughly inform herself on all matters pertaining to this work and not trust to luck in following the advice of any or every woman who presumes, through density of ignorance, to give advice on this important subject(186).

170. Experience shows that young women who know nothing and presume to know nothing about hand-feeding, and consequently have no bad rules to unlearn, are the most successful. These young women with their first babies are commonly more independent thinkers, and being trained and educated to seek information from proper sources, they logically reason out the cause and result, mark out their own course and follow it independently of all suggestions



from outsiders and only accept advice from the authority in whom they have confidence. It is this education and habit of an independent mode of thinking and acting which lays for them the foundation of their success. They seldom fail in raising strong, vigorous children, free from damage or the crippling effects of injudicious feeding.

171. Women who are anxious to show large fat babies, and whose ambition it is to excel all their neighbors in the size of them, generally fail in hand-feeding. They are so intensely anxious to make their infants grow that they never can feed correctly; that is, according to the proofs which the child presents in the character of the stools (272). They invariable increase the food too much or too often, and make all sorts of excuses to themselves and their friends to explain the digestive disturbances shown in the stools (284). They always attribute these unfavorable results to teething or some other nonsensical reason from the time the child commences drooling at three months, until it is two or three years old.

#### WOMEN SUITABLE TO DO HAND-FEEDING

172. Mothers who have nursed previous children successfully, but who are now compelled to wean the infant while it is under six months of age through inability to nurse it, seldom feed successfully until after they have made such errors that the infant's growth is hindered or its life greatly endangered, and only from the dread of the future and proofs of past errors do they exercise that stability, patience and careful thought which are necessary to bring a damaged child out of its precarious condition. Months of anxiety, worry and broken rest are always before those matured but inexperienced mothers in this unfortunate position.

173. From the above it will be seen that only one head can direct all changes in the feeding of a young infant (167). Where the mother's duties are such that she cannot give that continued time and attention which are always necessary for success, this work should be relegated to some reliable, intelligent nurse who must be characterized by the same qualities necessary in the young mother. She must be entirely free from all advices of outsiders, free from all preconceived ideas of right and wrong feeding, a good careful thinker, free from all prejudices for or against all kinds of food; patient, healthy, industrious and reliable. There are not many of these nurses to be obtained in any community, but there are always a few, and any young woman who is healthy, intelligent, and willing and who knows nothing at all about feeding an infant, will be sure to succeed with a good teacher or book if allowed to continue in full charge of the food and feeding, being only judged by the good results which she produces in the appearance of the infant, its happiness, steady growth and development (202). Where such a nurse realizes that healthy formed stools, free from foul odors, are proof of perfect digestion, and that this condition always guarantees future success, her labor is easy, and the infant's future growth is assured, if she maintains this condition.

#### IGNORANCE AND INEXPERIENCE

174. The mother or nurse who has raised other babies, well or poorly, and who has a strong, preconceived idea of what foods to use and how to feed an infant; in other words, who thinks she knows enough about this subject, is almost sure to overfeed and thus damage the child. A nurse should never be employed unless she be one who is intelligent

and industrious, but entirely ignorant of this subject, or one who has been previously thoroughly trained by some reliable physician how to guide all her advances and changes in food by the character of the digestion, as shown in the stools. The nurse or mother who has gone through this, who has raised one or more infants in this particular way, realizes the importance of this work and never makes suggestions about any food to an anxious, worried mother. Her experience has been such that she is thoroughly competent to realize fully that no one can intelligently give advice upon this subject who is not thoroughly conversant with the digestive power of the infant, its previous dietary and the mistakes made in feeding it. Without experience and this knowledge, it is impossible for any nurse, mother, or physician to speak intelligently on any particular case, and those who presume to do it, though meaning it in kindness and good will for the little one, would certainly not do so if they realized how thoroughly ignorant they are of the present necessities of each case. They do not know enough about this subject to know that they know nothing about it. They presume to give advice, thus illustrating that passage in scripture which says, "Fools rush in where angels fear to tread."

175. Physicians, experienced on this subject, give more thought, care and study to each infant whom they are feeding than they do to attacks of sickness of any kind which they are called upon to treat. In sickness, patients usually travel along lines common to the disease, and consequently, do not present one-tenth part of the various changes which occur in the intestinal tract of the improperly hand-fed infant. At each and every visit, a detailed account of the child's progress must be examined carefully from all points

of view before the physician feels safe in giving any advice regarding future changes which may be necessary in the infant's dietary. How, then, can any person, who is not well versed in this work and who has not had the necessary experience in feeding a great many children, presume to give directions where the child's health and even life may be endangered by such advice?

176. Mothers and nurses, who have had this experience, know and feel that the only sure and safe way for the mother is to get her directions from some one competent to give them, the same as they themselves were compelled to do, and the only one who should be competent to direct is the one who does this work most frequently, and that is the family physician (167).

#### THE IMPORTANCE OF PROPER DIET DURING THE FIRST YEAR

177. Very few people, excepting those who are making vital statistics in the health offices of the different cities and states of our country, have any conception of the number of deaths occurring among children at different ages in the cities and country districts. They, likewise, have little knowledge of the causes producing these various diseases from which so many of our children die. Aside from our own anxiety, we are all educated by our Daily Press and the necessities of business to hold in great dread the approach of all epidemics of contagious diseases, such as scarlet fever, measles, diphtheria, whooping-cough, smallpox, typhoid fever, etc. When an epidemic of any of those diseases breaks out in any city, town or village, the newspapers immediately advertise the fact and our health officers set to work with all diligence to placard the houses where the

diseases exist and thus prevent the spreading thereof. These precautions are all correct and as they should be. We are careful regarding these diseases because we are educated to the importance thereof. We all do this to save the lives of our children and to avoid sickness, with the consequent worry and anxiety which always accompany these attacks, no matter how slight they may be. From these epidemic diseases, yearly, we have a great many deaths and it is the fear and great dread of these deaths that makes us so nervous, cautious and anxious to do everything possible to protect our children from them.

178. Let us look, for a moment at the position we occupy as intelligent, progressive American people, on the very important subject of diseases and the care of our children. To illustrate this, we will take the vital statistics of the state of Michigan for the year of 1900. In this year, the number of deaths from all epidemic diseases is shown for the different months. Those statistics also show the number of deaths among children during the first year.

179. It is a well-recognized fact among physicians that two-thirds of all deaths of infants during the first year are the direct result of improper feeding. It is the writer's desire and object to show parents the exact position in which they stand regarding the care of their children from the day they are born until they are thirty years old, and also their mortality.

180. The following Michigan statistics for the year 1900 will illustrate our subject. They show the number of deaths in the whole state, cities and country included, of all children during the first year and also the number of deaths from the different diseases during all ages.

181. In that year there were 6,542 deaths of infants

under one year old. These figures do not include the number of children that were still-born.

182. During that same year the number of people of all ages dying from the following epidemic diseases: typhoid fever, diphtheria, croup, scarlet fever, measles, whooping-cough, and cerebro-spinal meningitis, was 2,571. These figures show that two and a half times more individuals die during the first years of their lives than from these contagious diseases at any and all ages. If we allow one-third of the deaths during the first year to be caused by diseases other than those that result from digestive disturbances, we then have 4,362 children under one year old dying from digestive disturbances every year against 2,571 individuals of all ages dying from those epidemic diseases which our health laws spend so much time and money to prevent.

183. If we look at the mortality statistics of the city of Detroit for the fiscal year ending June 30, 1903, we find that there were 1,187 deaths among infants during the first year and 1,167 deaths of individuals from all diseases between one and thirty years. Here, again, we have a startling evidence of the relative mortality of our population mostly from food errors during the first year and from all causes during the next twenty-nine.

184. If, as the experience of physicians shows, two-thirds of these 1,187 infants, who were lost during the first year, died from digestive disturbances, it proves that there are no diseases, accidents or combinations thereof which produce such an immense mortality as do these errors which we are committing daily in the feeding of our little ones; yet, this occurs continually and we continue to repeat the same errors, which are the direct result of our ignorance on this all important subject. Surely, nothing can speak more

strongly and decidedly than do the above figures, and there can be no greater proof of the necessity which exists for improvement in the care of our infants. We have become so accustomed to their frequent deaths that we look upon them as an unavoidable result.

185. As the state of Michigan and the cities in this state are among the healthiest in the country, or any place in the world, this infantile mortality rate will apply to every state in our union, and, possibly, many of them will show a much higher rate of mortality than does the state of Michigan or the city of Detroit.

#### DANGERS OF IMPERFECT HAND FEEDING

186. The greatest care and judgment must be exercised by the mother or nurse in adjusting the proper quality and quantity of substitute foods to the digestive power of each set of digestive glands, in order to avoid damage to any of them (169).

187. The rule is that all parts of the human body are strengthened by careful and judicious use, but are damaged by over-use or abuse. This means that if, in the digestive process, the artificial diet used contains no more fat or cream than the fat-digesting glands can consume perfectly, those glands will increase in strength and gradually consume a greater amount of this food. This rule also applies to the proteid and sugar-digesting glands (271).

188. Where this rule is not observed, it is an impossibility to avoid injuring the infant's digestive power. While many infants will stand this abuse for a long time and yet manage to survive it (210), there is a large class of infants, born with weaker digestive powers and inheriting nervous or other susceptible constitutions (472), who have great



difficulty in digesting enough artificial food during the first few months of their lives to enable them to make the usual increases in weight, growth and development. All these infants, other than the strong, robust ones, require the utmost care, judgment and attention, daily, to give them that continued suitable dietary which always results in healthy, vigorous children (165). Hand-feeding, when properly done, can nearly always be depended upon to give results second to those produced by perfect human milk.

### FOODS AND THEIR SOURCES

189. All foods are divided into two classes—the hydrocarbons, or heat-making foods, and the nitrogenous, or tissue-making foods.

190. The hydrocarbons are utilized in the body to maintain the temperature and to store up fuel in the form of fat, which can be utilized any time for heating purposes. This class comprises all fats, sugars and starches.

191. The nitrogenous foods are the tissue makers of the body, and from these, all repair growth and development are mainly obtained. They appear in the various forms of proteids or albuminous foods.

192. The above foods, with the addition of mineral salts, when well diluted in water, comprise all the elements which enter into the dietary of the human being.

193. They are obtained from the following sources:

Fats are found in milk, meat, fish, nuts, some fruits and all cereals. Oats and corn carry from eight to ten per cent. (30%), and all other cereals about one per cent. or less.

194. Sugars are found in milk and in many vegetable products, such as sugar-cane, sweet fruits, beets and some other vegetables.



195. Starches, being converted into sugar in the process of digestion, are classified under the same head as sugars. They form the bulk of all cereals, a large part of many fruits, about twenty-five per cent. of the bulk of the potato (313), and a small part of some vegetables.

196. Proteids and albumens, which form the nitrogenous foods, are found in milk and eggs and form the lean part of meat and fish (624-417).

197. The vegetable proteid is found almost entirely in the gluten which is the outer coating of all cereals covering the starch (315-318). The other forms of vegetable proteids cannot be utilized as human foods and do not require our consideration.

#### HUMAN MILK AS AN ASSISTANT TO HAND-FEEDING

198. It is amazing how much benefit is received by hand-fed infants from a few ounces of human milk daily. The good results seem to be far out of proportion to the amount given. This is very strongly illustrated in infants who fail with hand feeding. Physicians are astonished at what difficulties they frequently encounter in making a child grow after cutting out the last one or two meals daily of even a poor human milk. It seems impossible that this small amount should be so very nutritious and do so much good, even when of an unsuitable character. Rather would it seem that this addition of human milk to the whole amount of food gives greater digestive power and enables the child to take more benefit from the cow's milk than it was possible to do without the mixture of human milk; in other words, it would seem as if the human milk carries a digestive ferment in itself which assists the infant in digesting foreign food. This is always a very important subject to remember

when a feeble hand-fed infant has difficulty in digesting enough food to enable it to grow successfully.

199. Aside from this digestive element, what is more noticeable is the very rapid growth and improved appearance, both in flesh and color, which a few ounces of human milk daily will give. There is no possibility in these cases of making a combination of foods without it, equal to a mixture which carries a small amount thereof. Where hand-fed children are suffering from loose, disturbed bowels and are cross, fretful and unable to make weight, the borrowing of six to eight ounces of human milk daily from another mother will, and does, go far towards saving a child's life and making it a happy, thrifty infant.

200. It matters not what may be the age of the milk which is substituted in feeding another infant so long as the mother giving the milk has a happy child, is careful about her food, takes regular exercise and avoids taking medicine herself. Any time after her infant is a month old, the milk will be suitable for another child. Thus it will be seen that milk from a mother with a baby from one to ten months old may be used for an infant of any age so long as her own child is happy, comfortable and growing satisfactorily. It should be added to the other food, before feeding, in such quantities as will consume the regular amount of six to eight ounces daily. It is important that this regularity should be observed in the amount of human milk used from day to day, as irregularity in this article is sure to disturb the digestive organs of the infant.

201. The desirability of using five to eight ounces of human milk in feeding feeble, delicate children during the first year, cannot be too strongly impressed upon our mothers. In any neighborhood where there are children,

no difficulty should be encountered in finding a mother who will assist her sister in this way. Such is the motherly instinct. It is always her desire to assist another mother in this distressing position, and it should be more and more impressed upon women to cultivate this spirit of generosity and kindness, and also to teach mothers to ask for this assistance when the lives of their little ones are in danger.

### PREPARATION OF THE INFANT'S FOOD

202. The proper preparation of the infant's food is so important that it demands special and careful consideration. This is a duty which should be performed by only one person, and by that person at the most suitable hour for good food each day, and not the hour most suitable to that person.

203. Two persons can never prepare, measure or mix the different articles in the food in the same way. Variations in doing this work will nearly always give unsuitable results in an infant (173).

204. The milk used in the preparation demands that the food be prepared at that hour when it is in the best possible condition to make a perfect food. It is unsafe to allow milk to stand longer than is necessary, as this waiting often means souring thereof, and milk always deteriorates with age even when kept upon ice.

205. Articles requisite in preparing food:

1st—An eight ounce graduate to measure the different articles.

2d—One ounce dipper for removing cream from the bottle.

3d—One tablespoon or one-half ounce measure for the sugar.

4th—One quart pitcher to hold the mixed food.

5th—One glass or enamel ware funnel to fill the bottles.

6th—One bottle of lime-water.

7th—One package of non-absorbent cotton to stopper the feeding bottles.

8th—One dozen six or eight ounce round bottles to hold separate meals for each day.

9th—One large dish, or tray, for holding the above articles.

A graduate measure is necessary to measure water or milk properly. A tablespoon and a feeding bottle may be used for this purpose, allowing one half ounce for each tablespoon. The feeding bottle having been measured with the tablespoon can be used as a proximate measure, but it is always better to have a graduate glass for this purpose as the tablespoon may carry more or less than one half ounce, according to the way it is filled. A tablespoon may be heaped up one eighth more with water or only be seven-eighths full and both look the same to the ordinary observer. The graduate measure may be used only to prove the other measures, spoons, cups, etc., which cannot break with heat and may thus be used under all conditions. The cream may be removed from the bottle by pulling it out with a spoon when pouring it off, instead of using a dipper.

206. The first feature in preparing food is to make the sugar-water necessary for that day. A spoon can be used to measure sugar, but it is better to use a one-ounce glass ointment pot or glass measure, such as can be obtained at any drug store. In this the sugar can be packed and measured full or half, as needed, but the careful mother may use a tablespoon, packing and stroking the sugar to measure a half ounce.

207. Milk-sugar is dissolved in the quantity of boiling water necessary and thoroughly stirred (407). This solution should be allowed to cool, and proper amounts of milk and

cream added for the whole day's feeding. When more than one ounce of cream is used to every five ounces of milk, the milk should be used fresh (111). As six ounces of fresh milk usually contain about one ounce of cream, all extra cream needed can be added to the fresh milk.

208. When the food is all mixed, it should be divided into as many bottles as there are meals each day, and one, two or three teaspoonfuls of lime-water if needed, added to each bottle, according to the size of the meals and the season of the year. Large meals and warm weather may require increases in the amount of lime-water (398).

209. When the bottles are filled, they should be stoppered with cotton plugs and put upon ice. The cotton is needed to shut out new air and strain out bacteria in it. These cotton plugs should not be used twice and do not require to fit the bottles tightly.

The bottles should never be opened from the time the food is prepared until it is fed to the infant, as each exposure to the air allows the souring bacteria to enter the milk again (281-283). These directions are all that are needed during the first two or three months. Starches are usually needed after three months (303).

## FOOD EFFECTS AND THEIR SUBSTITUTES

210. The reserved power which nature has given in the digestive glands, as well as in all secreting organs in the healthy infant, enables it to care for extraordinary amounts of food and thus resist errors made, but only for a moderate time. Where errors are very large, the infant may resist them successfully for a week or ten days, and small errors may be resisted even for weeks, but it makes no difference whether they be large or small, the result is always the same

(166), the only difference being that the attacks come more quickly with large errors than with small ones.

211. Excessive amounts of fat, proteid or sugar injure those respective digestive glands required in converting them into healthy aliment. When an infant's digestive power is damaged in this way, an effort should be made to secure a proportion of foods which contains less of this injurious one and can be used as a substitute for the former dietary which caused the damage. It is a well known fact that there is no sugar, fat or proteid so suitable for an infant as these varieties found in milk, but other sources supply these foods and may occasionally be used as substitutes for them (218).

212. Where fat or cream has been over-fed and damage results therefrom, only small amounts will be digested for many months, but cod liver oil and other meat fats can generally be used. Many other fats have been tried, and, occasionally, one has been found satisfactory (300).

213. Where an excess of milk proteids has been the cause of injuries, meat juices generally form the most suitable substitutions. In older infants soft-boiled egg may be used very successfully for this purpose (417). These are the only available proteids coming from the animal kingdom, which can assist or take the place of milk proteids. In young infants, especially in very young ones, they are not at all equal in value to the milk proteids and only a limited number of infants can digest them successfully. The tendency of overfeeding these animal proteids is to cause indigestion and loose, green mucous foul stools. Where they act in this way, the amount should immediately be reduced within the possibility of perfect digestion, as shown by well-formed stools. Because milk proteids are not per-

fectly digested and curds appear with formed loose, splashy stools, it is not necessary to remove them entirely, but the amount given should be reduced within the limits of perfect digestion. No matter how small the amount of fat or proteids may be which can be perfectly digested, it is a very serious mistake to cut that small amount out of the infant's dietary (250).

214. Milk-sugar, in substitute foods, when given in excessive amounts, causes irritation of the glands suited for its digestion, and, consequently, lessens the power to digest that food, the same as occurs with fat and proteids. This is shown by sour, splashy stools and reddened rectum. This condition requires feeding of smaller quantities of milk-sugar (409).

215. When this reduction in milk-sugar impedes nutrition, cane-sugar may be partially substituted for it (408). In many cases it becomes necessary to use a baked or boiled starch as a partial substitute or addition to the dietary, when scalding of the rectum and watery stools show that sugar of any kind cannot be digested. In these cases showing impaired sugar-digestive power, a malted starch can seldom be fed as a substitute or addition to the dietary (327).

216. During the first three months, starch can be digested very feebly and extraordinary care is needed to prevent overfeeding it. Mothers make this mistake continually in feeding proprietary foods, which are mostly starch. Frequently they do this also with home-made starches (247).

217. There are no substitutes for starches, so that an injury produced by this food must always be corrected by lessening the amount fed, trying another starch or varying the mode of preparation from a boiled to a baked or malted, or in any direction other than the original one (325).



218. It is commonly found that the injury to one kind of digestive glands is so great that they cannot be used with any form of substitution at that time. In these cases the dietary must be made up entirely with the other foods. This is very much to be regretted, as no infant can grow and develop so well who is not able to take some of all the foods—fat, proteids, sugar or starch. The hope for the future, in these cases, lies in nature's power to repair the damaged parts and also to grow new glands as the infant becomes older. Unfortunately, in many infants, the injurious results are so severe and decided that repair is impossible and these children grow up deficient in stature, strength and digestive power and always require extraordinary care and discretion in order to enjoy moderate health. These weaknesses may continue for many months, or even years. With some, they continue all through life.

### THE HUNGRY CHILD

219. One of the greatest difficulties which a mother has to encounter in feeding her infant is the continual reminder by everybody, when a child cries or makes any noise, that the infant must be hungry. So often does she hear this, that, in time, it becomes a source of irritation, and after having listened to this advice eight or ten times daily for a month or two, she comes to realize that this is the stock speech of her friends and means nothing whatever. While, in the beginning, she generally heeds this advice and occasionally tests it by giving the child more or different food, she soon discovers that she must use her own judgment regardless of what her friends, old or young, may say or think (186).

220. When she arrives at this decision, she soon learns the infant's necessities and peculiarities of digestion by try-



ing different sized meals (429). A mother who has, consistently from the child's birth, followed the directions of the feeding chart (370), in time, has very little doubt regarding how to feed or manage her infant at any time. She soon learns that regular advances of the different foods in the dietary give such additions in weight or changes in temper, sleep and digestion that it is an impossibility for the child to suffer regularly from any disturbance other than hunger a few minutes before every time of feeding (345). When an infant's complaints are not of this character, she promptly recognizes the difference. This is one of the benefits that comes to mothers who know how much advance can be made in the food according to the changes in weight from day to day. The mother who has learned all the facts shown clearly by regularly filling the feeding chart each day, soon realizes the evidences of success which the infant presents at different hours of the day and feels independent of the foolish and senseless advices of kind, but thoughtless friends, and consequently, is not in danger of damaging her infant.

221. The mother who has not been properly educated on this subject, and whose efforts to feed her own infant have resulted in damage thereto, is continually open to these dangerous suggestions of her friends (169). She has an infant whose complaints and cries may, and generally are, thought to arise from hunger, when, in reality, they are due to over-feeding or wrong food.

222. The infant whose digestive organs have been continually stimulated to immense effort by irregularity of meals either in the size, frequency or quality of the food, is sure to make complaints or show disturbances such as will lead the mother astray and make her think that it is hungry,

when its stomach requires rest or different food. This happens mostly with infants who have been fed on a starchy diet, such as rice, barley, oatmeal or any of the proprietary foods. They are always craving for something, and are like the dyspeptic adult who feels relief for ten or fifteen minutes after meals and is in distress from that time until the next meal. The craving of the infant, in these cases, is for something that will allay this uncomfortable feeling in the stomach. A little water and lime-water will always do this better than food. A few drops of any hot drink, such as catnip, anise-seed, gin or whiskey and sugar-water will give the desired temporary relief.

223. It is always better to test the condition of the stomach by giving these hot drinks, in small quantities, rather than food. When an infant is more comfortable after the drink than after the food, it shows clearly that it has been overfed (228). The untrained mother of the damaged infant does not know this, and, consequently, is more inclined to give food. She does not realize that what the child requires is rest for its stomach by receiving more suitable, or less, food (246). The meals can be made smaller, given regularly and never given until the infant is hungry. When this is done, the infant ceases to make this distressing mournful, dyspeptic cry, and, in time, is able to digest the smaller amount of food perfectly and grow more rapidly than it had done on the larger meals which it had not digested.

### FREQUENCY OF MEALS

224. This is a subject of the greatest importance and one that always requires most careful thought. As there are all ages of infants, there must be all sizes of stomachs

from one ounce (in the new-born) upwards. This variation in size allows larger meals as the infant grows older, and also longer intervals between meals (287).

225. As in the adult, meals are always lessened with sickness and consequent decrease in digestive power, so must this also be done with the infant whose digestion has been disturbed by any cause (428). Infants who have been improperly fed in amounts, as well as in quality, of food have some digestive glands injured or destroyed. Just in proportion to the number thus crippled or unable to secrete enough digestive fluid is the power to digest food at any one meal reduced, and just in like ratio with this reduced secretion must the frequency of the meals be increased in order to nourish the infant properly and give healthy formed stools (651).

226. Hundreds of the writer's infantile feeding charts, filled by the mothers and showing the amounts and kinds of foods fed daily, demonstrate clearly that in infants there can be no increase in weight when they are kept hungry more than five to ten minutes between meals (501).

227. These feeding charts also show that intervals of hunger, twenty to thirty minutes long, between meals, will always cause a loss of four to six ounces weekly in weight; and when these intervals of hunger average ten to fifteen minutes regularly, the weight will usually be stationery. The above rules regarding hunger and weight apply only to infants who are properly fed, and, consequently, have only one, or at most two, healthy, well-formed stools each day (654).

228. When infants are improperly fed, either in the quality of food or in the amounts thereof, the stools will be foul, frequent, soft or splashy (263). In such infants, there can be no gain in weight, but, on the contrary, there must be

loss. In these cases, there is a continual craving for drink or food and the crossness of the infant must not be mistaken for hunger and more food given (222). The proportion of food must always be changed or reduced, where stools are of the above unhealthy characters, until they come formed and are not more than one or two daily. When this proof of correct feeding and perfect digestion has been secured, the infant may be classed with those having healthy digestive glands, and the hungry intervals between meals must not be more than five to ten minutes long in order to have the infant grow and thrive satisfactorily (654).

229. As infants having unhealthy stools are always suffering from indigestion, either in the stomach or bowels, small meals must be given; and in many badly injured infants, these small sized meals must be continued for weeks or months to secure that success only shown by healthy formed stools (428).

230. From the above different conditions in infants, it is apparent that the frequency of meals must always be governed by the digestive power of the infant. Some infants, badly damaged by improper feeding, may require small meals every hour, while others of the same age, who are better developed or whose digestive organs have never been injured, may be able to take meals large enough to satisfy hunger for three or four hours. The great necessity in all cases is to give that size meal which makes the infant happy, and repeat it often enough to keep its digestion occupied almost continuously while awake. This is the only condition which always guarantees the successful growth and development of any infant (696). The greatest care must be observed in regulating the whole amount fed daily. Irregularity in this feature always means failure. If the infant is happy and

gives healthy, well-digested stools on thirty ounces daily, it will be cross in daytime and sleep poorly at night on two to four ounces less and will also be cross, gassy, sleepless and give foul stools on one to four ounces more than thirty daily.

### INCREASES OF FOODS

231. As skim-milk gives strength and growth to the infant (389), it is always the most important part of the infant's dietary and also the one which requires to be most carefully handled. Well-fed, healthy growing infants of twelve to fifteen pounds in weight cannot properly digest additions of skim-milk greater than two and one-half to three teaspoonfuls each week. This, it will be observed, is less than one-half teaspoonful a day. Infants weighing only seven to nine pounds, and on full diet, cannot digest increases of one-half teaspoonful daily excepting for a week or ten days, as sickness always follows long-continued large increases (241).

232. It is important that the mother remember, in all her additions to the food, that perfect digestion must always be the only condition allowing further additions of any kind whatsoever, either in the quality of the food or quantity thereof. This perfect digestion is proven, on a milk diet, by the yellow, partially formed stools free from foul odors and not more than one or two each day. All additions to the milk diet give darker, but formed, stools when properly digested.

233. In order that the mother may estimate the probable amounts of these different foods which will be requisite, experience shows that, in cold weather, infants nine or ten months of age, weighing usually from eighteen to nineteen pounds, do not require, in their daily food, more than three to four ounces of cream and from twenty to twenty-five ounces of

skim-milk, all diluted with fifteen to twenty ounces boiled water, the whole mixture carrying from fifteen to twenty teaspoons of some well-cooked starch and sweetened with three to four teaspoonfuls of granulated sugar (243). In summer-time they cannot digest this amount of milk.

234. Every pound of weight in an infant requires so much food each day to nourish it properly and prevent loss thereof. All increases in weight require extra food to retain these increases. From this, it is evident that the amount of food needed in every infant must be governed by the size and weight of the child, rather than by its age (255).

235. Having considered these facts required by the mother to guide her in her increases of food, we will consider the different additions needed as the child advances in age.

236. The original milk-sugar solution of six to seven per cent. (408) may be strengthened whenever the infant can take a larger proportion of this food. When there is an abundance of milk-sugar in the dietary, it is better to make further additions to the six or seven per cent. sugar solution by occasionally adding one teaspoonful of granulated sugar to the whole day's food, as long as this addition does not produce a gassy or colicky condition or does not cause any redness around the rectum or watery stools (409).

237. The rule which the mother must now follow, in the correctly growing infant, is never to make more than one change in the foods or the whole amount of the daily dietary and then wait one or two days for the comfort of the infant and a healthy formed stool, to prove the correctness of the last advance (246).

238. By following this rule, she can make only a very small error and can always correct it by going back to the point where everything was properly digested. In this way,

she will never increase two foods at the same time, nor increase any food, and, at the same time, increase the size of the meals. Where a food is increased in the day's dietary the size of the meals should always remain the same. Where the size of one or two meals is increased in any day, it is not safe to increase the strength of the food. To keep the work simple and clear, it is better that all additions should be continued in one food only until the restlessness of the child or unhealthy stools prove that it has reached the highest point of perfect digestion of that food. As soon as this occurs with any food, advances should be made every second third or fourth day in another food until the point of perfect digestion in that is also reached. Having advanced all the foods, the next change should be made in the size of the meals. An increase over the amount suitable to the infant in every increase in the diet is indicated by the increased amount of gas thrown out of the bowels or belched from the stomach (491), and also by the foul odors of the gas and stools, as well as the tendency to increase the number and softness of the stools. At this point, the infant becomes cross, restless and sleeps poorly (289).

239. If we look at the amount of food which will be consumed by the new born infant and at the amount which will be consumed by the same infant when it is nine or ten months old, we will realize that the advances made from day to day must indeed be very small in order to be correct. It is only by thinking over carefully what these differences are that we quickly appreciate how small the daily advances must be to avoid doing harm.

240. The new-born infant may consume two to four teaspoonfuls of cream daily. The infant of two months may consume twenty-five teaspoonfuls daily, thus leaving about eigh-



teen to twenty teaspoonfuls of cream to be added to the infant's dietary during the first eight weeks, or an average of two and one-half teaspoonfuls each week during these first two months, and it may not be able to digest more than this amount any month afterwards.

241. The increases of skim-milk will be comparatively the same, but continue longer. The total amounts of skim-milk consumed from three to ten months will be very much larger than of cream. Probably, the infant of one month will consume one-half ounce daily and the large healthy infant of ten months about twenty-five ounces daily. These twenty-four ounces of milk represent one hundred forty-four teaspoonfuls, which, divided among forty-two weeks, will show a necessary increase of only about three and one-third teaspoonfuls weekly, or, in other words, about one-half teaspoonful each day (231).

These estimates of increase are amounts which healthy, well-nourished children will be able to digest. Smaller infants will not be able to appropriate these amounts.

242. Realizing now what is needed for success, the mother must remember that the foundation of her food is her sugar solution and that it is already of full strength (407), not requiring additions excepting the increases of the whole mixture as the child demands more food.

243. Having fed skim-milk, which contains all proteids necessary for the child's repair, growth and development (389), and having also added a proportion of cream which carries the fat needed for heating the infant, for lubricating the bowels and softening the stools (379), she must now be guided by the stools and weight for further additions to the dietary. When the stools become constipated and the bowels have difficulty in moving, the indications will be to add a



teaspoonful of cream every two days until the stools resume the requisite softness but still retain some form. It will be observed that, as the stools become softer, they show more yellow in color. When stools show the requisite softness and more food is demanded, additions must be made of skim-milk. Usually, after the second month, the amount of skim-milk needed is from two to ten times more than the cream, and the amount of sugar is about one-twentieth of the whole day's food and the water mixture until starch is added.

244. To feed well and avoid all possibility of damaging the infant with unsuitable dietary, it is absolutely necessary for the infant to be weighed regularly, as there is a limit to the speed at which the hand-fed infant can grow. During the first six months, this rate of increase can seldom be more than one ounce daily; from six to nine months, never more than one-half to three-quarters of an ounce a day, and from nine to twelve months, not more than one-half ounce each day (475). While these figures should not be looked upon as an unchangeable guide, yet they express conditions which are necessary to observe in feeding a healthy, vigorous child so that it may continue to be healthy and free from all digestive or physical blemishes, and at the end of the first fifteen months, if properly fed, will be able to take largely of a solid dietary (735).

245. It is quite a common thing for an overfed infant to thrive and improve with advances in food, and, when these additions are stopped, to continue growing and making weight just as rapidly for three, or even four weeks as it did before the increases ceased. This occurs only with infants who are fed too liberally. All increases of food should be stopped occasionally for a few days to ascertain whether they are needed or not.

246. When it is found that after the increases in food are checked, the infant fails to make weight and becomes restless and wakeful, particularly at night, without any gassy disturbances or foul odors, it is plain that more food is required (267). When the mother fails to prove her work by giving her infant this rest, she is likely to advance the dietary too far and cause acute indigestion, diarrhea or dysentery (223).

#### GENERAL PRINCIPLES GOVERNING NECESSARY CHANGES IN FOOD

247. The infant commences life with digestive glands suited for the conversion of animal foods only. As the child grows, new glands are continually being added to those in existence and the existing ones are increasing in size, strength and number, so that, as the child becomes older and is properly fed, its power to digest larger amounts of food is greatly increased. When two or three months old, the healthy infant is enabled to digest different forms of starch, if properly prepared and given in suitable small amounts, in addition to the sugar, fat and proteids which it has been receiving in its milk dietary from birth (303). In infants two to three months old, there is a moderate power of starch digestion and this when needed, assists materially in modifying the diet. When the sugar, fat, proteids and starch are carefully raised up to the infant's capacity and increased steadily as the child digests it perfectly, there is no disturbance produced in the digestive tract, no sickness results through the dietary and the infant grows steadily from month to month (696).

248. In an infant fed in this way, the only change requisite is to gradually increase each food as the infant be-

comes older, and when about a year old, possibly, also lessen the amount of fat or proteid which has been fed originally. There is, perhaps, only one exception to this and that is the necessity for reducing the milk-sugar steadily while increasing the starch dietary (412).

249. Where an infant shows imperfect progress and failure to make weight, the error can always be found, if a digestive one, in the amount or character of the fat, proteid or sugar which has been fed. Usually this can be traced by the stools to the particular food which is wrong and that one can be reduced to the necessary amount (263).

250. Because a food has been found to disagree, it should not be entirely discarded from the dietary until it is clearly shown that the digestion is disturbed by the smallest amount of it. In order to save time in making changes it may be best to remove that food entirely from the dietary. Should this removal be followed by correct stools and a happier condition of the child, an effort should be made to put it back in small quantities until the exact amount which the child can digest perfectly and comfortably is shown. It is a great mistake to permanently remove any one food from the dietary of the infant until the soft, foul, mucous or watery character of the stools shows clearly that none of it can be digested. An effort should always be made to retain the largest amount of every food which can be digested with comfort and which shows no disturbance in the stools (186).

251. In many infants, nursed or hand-fed, whose past progress shows irregular growth and frequent intestinal disturbances while fed upon a purely milk diet, the power to digest one or more of the foods in milk has been very much lessened or, perhaps, entirely lost. This is an unfortunate

condition and will demand most careful thought and study to select dietary which will take the place of these milk foods, or such parts of them as it may be necessary to remove from the infant's meals (253). Very commonly, it is found that the infant who does fairly well without any cream is sickened immediately on the addition of one teaspoonful thereof to the whole day's food (300). Again, it is very common for infants to fail in digesting skim-milk until this is reduced to a small quantity, perhaps six or eight ounces daily. It is not so common to find the power to digest sugar decreased or lost (410).

252. In infants over eight months old, the difficulties in substituting other foods for those in milk are very much lessened. The starch digesting power of these infants is so much increased as well as the power to digest different proteids, that they are more easily fed when they are damaged than they would have been when much younger. There are great varieties of starches, both liquid and solid, which are suitable for infants of this age (329). It is then that crackers, toast, crusts (771), and gluten foods (317) can be fed in small amounts.

253. The general principle, then, in these cases, is to reduce foods which the infant has been consuming in excess to that point where healthy formed stools are produced (266), and to substitute other forms of the same food or some of the different varieties of starch (324) and gradually build up a diet which the infant can digest perfectly and upon which it can grow. All these changes must be done gradually and cautiously, being careful not to injure any more digestive glands or bring on attacks of vomiting, diarrhea or dysentery by making too rapid changes in the amount or quality of the food (237).

254. To assist in doing this work systematically and carefully, the author has been compelled, from experience, to devise a feeding chart which shows, in the daily dietary, the amount of each food, the size and number of meals in daytime and at night, the character of the digestion as proven by the stools, the changes in the weight of the infant, the character of the sleep and temper and the length of time which an infant requires to digest each meal.

By examining each question on this chart, we will have the summary of all information usually requisite in feeding infants (370).

#### WHEN AND HOW TO CHANGE THE BABY'S FOOD

255. 1st—When an infant with healthy formed stools does not gain in weight, increase the size of some meals or feed more frequently. If there is still no gain, increase the size of more meals or of every meal, and if this does not bring the desired result, increase one of the foods contained therein. These increases, to be successful, must give healthy stools. A sick stomach, gassy discharges, foul odors and loose bowels following any increase are evidences of an error in the food or overfeeding (238). An infant cannot gain in weight who is hungry more than five to ten minutes between meals (226).

256. 2d—The hungry baby cries, sucks its fingers, sleeps poorly, awakens frequently, but does not suffer from belching of gas, foul odors from the stools or extra gassy discharges (219-223). The food must, in this case, follow the same directions as in No. 1.

257. 3d—Vomiting immediately after a meal is evidence either that the meal is too large, the baby has been raised up too soon, has been shaken up too much, has too much

pressure on the stomach or the food is wrong in some way (451).

258. 4th—When vomiting or spitting of water occurs between meals, the meal is too dilute and too large and the water in the food requires to be reduced until this ceases (449).

259. 5th—Vomiting of food thirty or forty minutes after eating or before the next meal indicates that there is too much cream or sugar in the food (382 and 452).

260. 6th—Baby has colic. This is known by belching of gas and intermittent sharp cries with relief after passing gas from the bowel. The meal itself, or some part of it, is too strong and causes indigestion. Reduce the proteids (skim-milk). If this does not give relief, reduce the cream, sugar or starch. Colic is usually accompanied by soft green or mucous stools when the proteids are too high. A properly fed infant does not suffer from colic (152).

261. 7th—Fever. When baby is feverish from any cause, the meals should always be reduced in size—one quarter to one half—in proportion to the fever. If the fever is very high, (103 to 104 degrees), the food should be stopped entirely for one, two or three days (506-508). An abundance of water should always be given to replace the food which has been removed and also to satisfy the thirst (337).

262. 8th—Loss of appetite. This occurs mostly in infants who look and act well. They are usually over-fed.

Reduce the strength of the food one eighth or one quarter, making up the amount reduced with warm water. Excess of cream usually causes loss of appetite. It should be reduced and skim-milk increased the same amount, in infants who are not growing satisfactorily (300).

263. 9th—Baby has unhealthy stools:

When stools are very yellow, foul, greasy or ropy, reduce the cream.

When curds appear in the stools, reduce the skim-milk.

When stools are very dry, crumbly and of a grayish-yellow color, increase the cream (243) and reduce the skim-milk.

When stools are green with much mucus in them, reduce the whole food one quarter or even more, or reduce the skim-milk only.

When splashy or gassy foul stools follow a healthy condition on previous days, take out the last addition or reduce the whole amount of food.

Where starch is a part of the diet and it is necessary to increase it in order to increase the weight of the child, if such addition causes soft, gassy stools, reduce the sugar (412).

Additions of meat juices and starches always produce a darker or brownish color in the stools (463).

264. All changes in food are made to improve the condition of the infant.

265. When the digestion is perfect and the infant is unhappy, all changes should be increases of food to satisfy that hunger which causes this crying, fretting and unhappiness (256).

266. When foul, many colored, gassy stools show that digestion is imperfect, the dietary can never be increased. That food in the diet which is not perfectly digested and causes these unhealthy stools must be reduced until healthy stools appear. Often these stools show that all the food must be reduced to produce that healthy consistence and odor requisite for health (249), and perfect development.

267. The foods in use can never be increased while stools are foul odored, slimy, watery, gassy, foamy, many colored



or numerous, but they can be increased when the child is constipated or the stools well formed. All increases should be made as per paragraphs 231-246.

### FEEDING THE DAMAGED INFANT

268. It is a common thing to see a nursed or hand-fed infant damaged in its digestive power so that it does not weigh more than one half to three quarters of the average weight. This very small size may be seen at any age from two weeks upward. These infants are usually long enough, but they fail in the amount of flesh they should carry in proportion to their length. This result is, of course, obtained by the unsuitability of quality and amounts of foods which have been given them, and our efforts must be made to correct past errors by assisting these infants who have only a limited power of digestion to appropriate the food or foods necessary for their success (103). These cases may have been nursed or hand-fed previously, and usually show the greatest difficulties encountered in hand-feeding. The unusual anxiety and desire of the parents to make the hand-fed infant grow is a common cause of this condition (171).

269. Where errors occur in the dietary, due to the wrong quality of any one of the elementary foods or to any of those foods being fed in excess of the digestive power, the infant is usually irritated at the point which has been over-worked. This occurs with imperfect nursing and also with unsuitable hand-feeding, and where it continues for any length of time, the pale color of the infant, its soft flesh and failure to increase in weight indicate a condition that demands a change in the dietary (249).

270. The younger the infant is in whom this mistake occurs, the greater is the difficulty in correcting the error;



and in very young children, those under two or three months of age, it requires the greatest care to correct these errors without using good human milk as a substitute for the present diet (198).

271. There is one principle which must always be observed; that is, *to keep the infant's digestion healthy even if it remains light in weight*, and this is done by feeding only that amount of each food which is perfectly digested and gives well formed stools. Where this principle does not continually govern every move, change and addition to the food, good results cannot follow the most anxious efforts for the child's improvement (187).

272. These infants should be weighed regularly every day on a reliable pair of scales, and as long as they do not lose weight, the present dietary is a safe one and all additions and changes in the food must be those which give one or two healthy, well-formed stools each day (244). The rule applying to this condition, is that stated above (271), knowing well that, in time, new glands will grow with the child's growth and the old ones will be strengthened and improved, so that, in the course of a few weeks or months, the child's digestion will, if properly cared for in the meantime, be able to appropriate larger amounts of food.

273. This is always a very trying time to both parents and physicians who are all usually worried much by the kind but untimely suggestions of friends, neighbors and even strangers. There is only one way out of this complication and that is by the rule above cited; so long as the infant digests enough food to hold its own weight or perhaps gain an ounce each week, its future success is assured.

274. Where the scales show that the infant is gradually losing weight, it is apparent that the damage has been very

great, indeed, and prompt efforts must be made by making small changes in or additions to the food to check that loss of weight (255), but usually some weight must be lost, before a suitable amount of the correct food is secured to check it.

275. In all these trying cases, the very beneficial effects of peptonizing the proteid foods must be remembered (150-156). When this is not sufficient, the great power and nourishing qualities of good human milk should always be remembered (198).

### FEEDING IN HOT WEATHER

276. The digestive power of an infant changes with the different seasons of the year, the same as that of an adult. With the approach of cooler weather in the fall, all physicians notice a marked improvement in the digestive powers of infants under their charge. Mothers who have raised several children have also noticed this fact, and look forward to the approach of cool weather as a means of correcting slight disturbances from which their children suffer during the warm season. It is a noticeable and well-marked fact that many infants' lives have been saved merely by the advent of cooler weather (280).

277. Statistics show that infants commence to make weight rapidly in the fall, when cool weather approaches, and continue to do so during all the cool weather, as long as they are properly fed (180). Experience also shows that these same children fail to show those increases in weight during the hot summer months and that many of them really lose weight without showing much evidence of sickness. No efforts should be made to obtain those rapid increases in weight, during the hot summer weather, which are possible during the cooler weather.

278. The beneficial effects of the cool season are so well known and so generally recognized that it is a standing custom, in all large cities, for people to provide for a change of residence during the heated term. Such parents usually send their children to the mountains, to the seashore or farther north where the weather is much cooler than in hot cities. In doing this they recognize that the child's digestive power is always better in cooler locations than in hot ones. This applies to infants who are teething as well as those who have passed beyond that stage (341).

279. Where it is impossible for parents to avail themselves of this change of climate, it becomes necessary for them to realize what they must do to secure safety and remain at home during the hot season. If they would consider the difference in their own habits, their own desires and the changes they make to insure their own comfort in hot weather, they would have a more or less reliable guide in caring for their young infants and children.

Every healthy individual notices that his appetite decreases and his thirst increases in hot weather. Sensible people usually follow this indication and, instead of eating such large quantities of meat, potatoes, bread and other strong, rich dietary, they partake more of the lighter articles, very materially increasing the amount of drink which they consume. In this way they do not suffer from indigestion or diarrhea and are able to regularly perform their ordinary duties. It is only necessary that infants should be given the same privileges that parents demand for themselves; that means, in hot weather, to lessen and lighten the food they consume and increase the amount of water which they are allowed to drink (142).

280. When as much strong food is continued in summer, digestive disturbances are likely to follow and sickness, with

great loss in weight, will be the consequence. The digestive power of an infant is reduced just in proportion as the heat increases. The natural and necessary inference, therefore, is that the food should always be decreased in one or more meals on hot days. It should always be a standing rule with mothers, in hot weather, never to feed any oftener than the regular meals, but to satisfy the crying and uneasiness of the infant by giving it frequent drinks of water. If this is done regularly, the infant will not demand such large meals and will very frequently refuse a portion of them. In this way they unconsciously protect themselves from sickness, remain happy and sleep well. Infants, treated in this way, do not suffer from summer diarrhea (337). One liberal drink of milk in hot weather kills many a child.

#### CARE OF THE FOOD IN THE SUMMER TIME

281. Fermentation or decomposition of food increases in rapidity in direct proportion to the increase of heat during the summer season. This fact demands the utmost care on the part of the mother to protect the food from those changes which will be injurious to the infant. This applies to all forms of food, but more particularly to milk and meat juices. An abundance of ice must be used to maintain a continued low temperature in the refrigerator or ice-box where the food is kept. Changes in the temperature of the food through temporary shortage of ice are very dangerous indeed. It must be the aim and object of the mother to so completely preserve the coldness of the food that there can be no possibility of hot air affecting it unfavorably (209). The most violent cholera infantum and all other forms of summer diarrheas are caused by sour milk food (366) or decomposing meat juices. To avoid this, the mother should

prepare the food as soon as possible (204). All milk must be pasteurized (145) or sterilized (148), cooled quickly with the stream of cold water and then placed upon ice. A slow process of cooling food without the use of cold water or ice is sufficient to destroy all the beneficial results produced by pasteurization.

282. Care should always be taken, especially in the summer time, to see that the infant takes its meals while they are yet warm. Where a child is allowed to doze and stop nursing, the food should be immediately removed. In the warm but not too hot condition, animal foods spoil very rapidly; consequently, it is a necessity to make the infant take its food at once and never leave the bottle to be taken after it has cooled off. Giving cold food to an infant who is accustomed to hot food is very liable to cause indigestion and colic.

283. The practice of propping the bottle upon a pillow with the nipple in the baby's mouth, thus allowing the infant to doze while taking its food, can not be too strongly condemned. This is especially the case during the hot summer season, and the life of many an infant has been sacrificed through this careless, thoughtless habit. The bottle should always be held while the infant is nursing, and as soon as it ceases to draw, from any cause whatever, it should be removed at once, the contents thrown away and the bottle rinsed (365). It is never safe to heat a meal over again and use it as a second feeding.

#### AMOUNT OF FOOD AND SIZE OF BABY

284. The two main factors which cause failure in feeding young infants are:

1st.—Using wrong foods.

2d.—Giving too large meals (171).

285. As we have treated the foods suitable for infantile feeding in different articles, we will now consider the amount of food suitable for infants of different ages.

286. It is a well recognized fact that the capacity of the stomach is in proportion to the weight of the infant; consequently, an infant of four or five pounds in weight, when born, is unable to take as much food as an infant of eight or nine pounds.

287. The average weight of the new-born infant is from seven to seven and one-half pounds and the capacity of its stomach will average about one ounce, or six teaspoonfuls. As the infant grows very rapidly during the first three months, the stomach must increase in size in the same proportionate speed. The infant one month old, when properly fed, has grown so rapidly that the stomach will hold about two ounces, or twice as much as when it was born.

288. At the end of three months, this infant, if healthy, has grown so rapidly that its stomach capacity is four times greater than it was at birth, or four ounces. As the growth of the infant after three months is much less rapid for the next three months, the increase of the stomach capacity is correspondingly less and increases with decreasing rapidity in proportion to the child's age and growth from this time onward.

289. It will thus be seen that, as the increases in weight and in the size of the stomach are in direct proportion to each other during each quarter of the first year, the meals must increase only in corresponding ratio. Very seldom will it be found necessary to give an infant, under a year old, meals larger than six to seven ounces. While many infants, fed very dilute foods, are often given eight, ten or even twelve ounces at a meal, this can never be done with

safety when foods are of the proper strength. Meals of such large size stretch the stomach and weaken the digestive power correspondingly (434). The addition of so much water to the food throws an immense strain upon the kidneys and keeps the child constantly urinating. This can be of no advantage, but, on the other hand, lays the foundation for future Bright's disease in many cases (338).

#### FOODS REQUIRED IN THE INFANT'S MEAL

290. As we have previously shown, there are three foods in human milk, and, in the infant, a corresponding supply of glands to secrete the fluid suitable for digesting these three foods (33).

291. If we could obtain an unlimited supply of human milk, we could follow nature's proportions of these foods without any trouble and expect to have good results at all times in feeding healthy, normal infants; but, as the amount of human milk obtainable is very limited, we are compelled to procure the fat, proteids and sugar from the next best source, which is cow's milk; but they are not the same as those in human milk. This fact at once presents many difficulties of which the inexperienced have little conception.

292. The general principle of feeding with cow's milk was based by many physicians upon the proportions of foods in human milk, but this division is well known to be a very uncertain and unreliable guide. Selecting the amount of fat, proteid and sugar necessary for feeding an infant from cow's milk, according to the human proportion, very quickly convinces any one that the figures must be wrong or that the foods in the two milks are not of the same quality. In direct proportion to experience in doing this work will be



the conviction that these foods in human and cow's milk are very unlike each other in quality and in their effects upon the human infant. If this were not the case, we would not have the great difficulties which are frequently encountered in adjusting a diet, made of these foods, to the digestive capacity of infants (94-97).

293. To meet these difficulties as they are encountered in different parts of the country from the milk of various cows fed upon different foods, it is necessary to be governed not by one formula, but to have the privilege of using one out of many formulas, always selecting that one which agrees best with the infant and which makes a happy child—one who always has healthy, natural stools. The following schedules of formulas (573-579) have been found by the author necessary to meet the many variations in milk in different localities and also the varying digestive secretions of infants at all ages. These formulas are given at different ages and for different weights of infants, thus enabling the mother to commence substituting food at any time during the first year of the infant's life.

294. Any formula, to be successful, must give the following results in healthy infants:

1st—Weight increasing steadily.

2d—A happy baby while awake.

3d—An abundance of quiet and continued sleep.

4th—One or two natural soft or formed stools daily.

5th—Freedom from foul odors or frequent gassy discharges from mouth or rectum.

Only that formula which gives the above results will guarantee *present* and *future* success in an infant's growth and development.



297. Top-milk is recommended by some writers for infantile feeding. A twelve-per-cent. top-milk is made by mixing equal parts of ordinary cream and fresh milk together. If very "heavy" thick cream is used, there should be three parts fresh milk to one part of this very "heavy" thick cream.

298. The best way to obtain twelve-per-cent. milk is to place the fresh milk in a tall glass jar, such as a fruit jar or a milk bottle, and let it stand surrounded by ice or in a cold room (forty degrees) for four or five hours. The upper one-fifth (six ounces from one quart) may be calculated to contain twelve per cent. fat. If the milk is very rich, the upper one-fourth (eight ounces from one quart) may be used. If milk is used which has been bottled at a dairy the day before, the upper one-fourth (eight ounces from one quart) may be calculated to contain twelve per cent. fat. This top-milk may either be removed by skimming or the bottom layer of milk may be siphoned off, leaving the number of ounces of top-milk desired. Should more than six ounces of the twelve-per-cent. milk be needed, two quarts of milk should be set. The proportion of fat in these mixtures is very uncertain.

299. If milk can be obtained fresh from the cows, it is to be preferred on account of its purity (562). The food can then be made up when the milk is but a few hours old (559 to 561).

300. Experience shows, in feeding top-milk, that very many children are not able to digest much fat, and a continuance of this high percentage of top-milk in the dietary entirely destroys the power of the digestive glands to dispose of this item. Many infants who have been fed in this way

for a time become unable to take care of the fat, as it causes vomiting, and frequently has to be very much reduced or removed entirely, as the smallest portion can not be digested. In these cases, skim-milk has to be substituted for both milk and cream.

301. To suit the digestion of all infants, the following schedules (573-579) will show the amounts of this food and other foods needed in feeding them. The great variation in the proportion of the different foods in these schedules will impress the reader with the imperative necessity that exists to always adjust the amount of each food to the actual digestive power of the infant rather than by fixed ideas of what each infant can or ought to take (187). Without knowing the effect of each food upon the digestive power, it is impossible for any one to feed an infant correctly and guarantee its future growth and development (272).

### STARCH

302. Starch, in its many forms, composes sixty per cent. of the dietary of the adult, and animal foods make up the other forty per cent. The young infant, in its growth and development, necessarily passes from the entirely animal dietary of the first few months to one composed more or less similar to that of the adult. Nature has so arranged it, that while she does not give the infant the ability to digest starch, except in very moderate quantities during the early months of its life, yet the secretion of saliva in the fourth month and the consequent drooling of the infant indicates the increasing power of the little one to take this in addition to those foods which milk supplies (581).

WHEN TO COMMENCE FEEDING STARCH AND HOW  
TO FEED IT

303. Very little starch can be fed during the first three months, but, in some infants who must be hand-fed, small portions can be advantageously used during this time. As the infant's digestive power increases and changes somewhat between three and six months, it allows starch to be increased materially during this period. Between six and nine months, any healthy infant can and should consume a fair proportion of some starch in addition to its regular milk diet. After nine months, this amount of starch should be very materially increased, and, in most cases, the milk diet will decrease somewhat during this time (252). Before the infant is fifteen months old, it is always able and should consume a diet, which is, at least, one-half starch and largely of the dry kind which the parents use themselves (735-740).

304. During the first three months, starch may be prepared for food by boiling, thus making what is termed starch-water, always of a fixed strength. This boiling is called dextrinizing the starch when it is thoroughly done. Usually, this strength is one tablespoonful of oatmeal, wheat, rice or barley flour or two tablespoonfuls of the flakes to a pint of the finished product. This starch-water must be added cautiously, not more than one teaspoonful to every second or third bottle as a commencement of this dietary. If it does not show any fermentation in the way of gassy discharges from the bowels or stomach, this amount can be repeated and gradually increased as long as it does not make the infant colicky, gassy, uncomfortable or cause it to be too constipated. Increases in starch should not be made oftener than every second day, as this time will always show whether they are digested comfortably. Where starch

makes the child gassy, colicky and uncomfortable, smaller amounts should be used and another, such as a baked starch, tried (217). When a satisfactory starch has been secured, the amount can be gradually increased as the child grows older, so long as it is comfortably digested (330).

305. Starch, in the form of flour or flakes, requires from one-half to one hour of rapid boiling to dissolve it suitably for feeding. Nearly all starches are now prepared in the form of flakes, most of them being used as breakfast foods. As these foods are already baked and ready for adult digestion, they only require half an hour of steady boiling to make them suitable for infantile food (329).

#### STARCH IN ITS RELATION TO SUGAR

306. All starch is converted into sugar in the process of digestion; consequently, it always supplants or reduces the amount of sugar in the dietary in proportion as it is added thereto. The indications for this reduction are increased amounts of gassy discharges, or redness and scalding about the rectum. If these do not receive early attention, the child soon becomes cross, colicky and very gassy, with watery, splashy stools.

#### FEEDING STARCHES AND EFFECTS THEREFROM

307. A pure starch is a constipating food and additions of it to the milk dietary have this effect (316). All starches carry a certain amount of fat and are relaxing in direct proportion to the amount of this food which they carry. Oats and corn have the largest amount of this article, about eight per cent. They are, consequently, the most relaxing starches. Of these two, the oat starch is preferable, as it has an agreeable taste and makes a smooth, pleasant mix-

ture with milk. Corn-meal is very seldom used in this way. Rice, barley and wheat have less than one per cent. of fat and are therefore more constipating than oatmeal. Of these three, rice starch is the most easily digested, carries the least fat and is most constipating. It makes a very thin starch-water, passes through the nipple easily and is a favorite with mothers. This allows the strength to be greatly increased when needed for older infants (304).

308. Barley is not so constipating as the rice nor so relaxing as the oatmeal. The varying effects of these different starches always allow a selection of the one most suitable to the digestive power of each infant. When an infant shows inability to digest the fat in milk, it will nearly always be found impossible to feed oat starch, as the fat in this food effects the child much the same as that in milk.

309. As oatmeal is relaxing to the bowels and rice is constipating, these two foods are commonly mixed together in a proportion necessary to give healthy, well-formed stools. By alternating these two articles or mixing them together, the varying conditions of constipation and looseness in the stools can generally be corrected.

310. In addition to the above starches, arrowroot, tapioca, corn-starch and farina are valuable starch foods and can be cooked in the same way.

311. The comparative strength of all starches can be estimated by their weight. Usually, one tablespoonful of the meal flour, or broken grain, is equal to two tablespoonfuls of the flakes.

#### SALT IN GRUEL AND MILK FOODS

312. In the preparation of the different foods for young infants, the question frequently arises regarding the addition

of salt. This is an important one. The addition of a very small proportion of salt is nearly always desirable, but not to such an extent as to be tasted in the food. Salt frequently has a laxative effect and may cause a weak, loose condition of the bowels when added too freely. As all starches, excepting that from oatmeal, are constipating when fed in proper quantities, that is, below the point of fermentation in the bowels, salt may cause confusion if it relaxes, and thus demand unnecessary changes of the starch, or such reduction as will avoid these loose stools (307). It is therefore better, in very young infants, that very little salt be added to the foods. There is generally enough of this article in the mother's milk or in cow's milk for perfect digestion and nutrition. In older infants, who are taking more starch food and less milk, salt can be added in moderate quantities with advantage to digestion and benefit to the child.

#### POTATO AS AN INFANTILE FOOD

313. Potatoes carry from twenty to twenty-five per cent. of starch, the balance being made up mostly of water and cellulose, which is a wood fiber containing no nutriment of value. It is a very favorite form of food with young children, and when of a good dry variety, is very suitable as a diet for infants over a year old. During the summertime, when old potatoes are soft and soggy and the new ones are not thoroughly matured, this form of starch should not be given to young children. When fed at this season of the year, it is very difficult to digest and, very commonly, causes stomach disturbances.

314. Potato starch cannot be used as an addition to the milk dietary of very young infants and is greatly inferior in

value to wheat, rice or barley starch for all infants under a year old.

## GLUTEN

315. Gluten is a vegetable proteid, an element which gives strength and growth to our domestic animals. It is found as a thin layer of cells immediately under the horny layer of all grains or cereals and also forms a large part of all grasses. When it is desirable to add a vegetable proteid to the dietary, it is better to select a flaked food, as it carries the starch and gluten together, or take a pure gluten food.

316. Starches form the great body of all grains or cereals (195). Pure starch is entirely white in appearance (307).

Where the whole grain is ground, the gluten and starch mixed together give the product a dark shade. In our commercial manufacture of flour, machinery has been so perfected as to remove the outer part, or glutinous coat, of the grain and leave the pure white flour alone. This flour is almost pure starch. It will be seen, then, that where it is necessary to add vegetable proteid to the dietary, it is not desirable to select the very white starch, but rather take one that is dark in color. To avoid confusion and uncertainty on this point, gluten food or gluten flour may be selected as part of the flour dietary. Manufacturers of proprietary foods necessarily darken the starches in their process of malting or baking the foods, and this color should not lead us astray in selecting them instead of a food carrying a fair or natural proportion of gluten.

317. Great care must be exercised in the addition of gluten to the infant's dietary, as only small portions of it can be digested, and excessive amounts thereof will cause fermentation and loose stools. Additions should not be larger than half a teaspoonful to the whole day's dietary



until the well-formed stools of the infant prove that it can digest a larger quantity, and then additions of this amount should not be made more frequently than every second or third day.

318. Gluten foods are mostly obtained as a by-product in the manufacture of corn-starch and are sold in packages like other breakfast foods in all large cities. Gluten flour, which is dark in appearance is also sold for making bread and biscuits. Gluten water is made as per 784.

### PROPRIETARY FOODS

319. Under this head can be included all dry forms of proprietary or patent foods, and also the greater part of those foods in the moist or liquid forms. Manufacturers of these foods depend mostly upon wheat for the bulk of them. Some use barley, and an occasional one oats, but where they do not mention barley or oats on the label, wheat flour is the only form which they use.

320. In making these proprietary foods, the wheat flour is either malted or baked and put upon the market either alone or in combination with dried milk, egg or some other commodity, thus making a simple or a complex mixture. The malted starches are represented by "Mellin's Food" and "Horlick's Food" (327). The baked starch is represented by "Imperial Granum." All of these are good foods when given in proper quantities to infants whose digestive organs are suited for them. Some infants can digest malted starch and become constipated, while with others, it acts as a laxative and therefore cannot be continued except in those small amounts which give only one or two well-formed stools each day. "Imperial Granum" is a very good food and does not cause such relaxing effects as the malted starch,



often requiring the addition of malted starch to overcome constipation. The mixed proprietary foods suit some infants and, like other forms of food, are injurious to others. Some of them, such as "Malted Milk," are mixtures of malted starch and dried milk. Others are mixtures of baked starch with milk, such as "Nestle's Food." Others, such as "Eskay," mix their baked starch with sugar, dried egg, and some with other ingredients also.

321. "Robinson's Barley Flour" is a very good form of starch and is easily digested by those infants to whom it is suited. "Robinson's Groats" is a preparation of oat starch. Both of these articles are readily and easily prepared, requiring only a few minutes' cooking.

322. In these foods composed of baked starch, the wheat flour is made into thin cakes, perforated freely and baked thoroughly. These cakes are then ground into a fine powder similar to flour. This process of baking ruptures the starch cells and renders it more digestible for infants in the same way as well-baked bread is more comfortable to the tender stomach of the adult than is raw, under-done bread. This ground powder makes "Imperial Granum" and the great bulk of mostly all the other proprietary foods by the additions of dried milk, egg and a little malt.

323. In other preparations, some of the foods are made by adding dried milk to the baked starchflour, making a very good food. Of this type, "Nestle's Food" is a good illustration. In all liquid foods placed upon the market, there is a large proportion of starch, but, as they are more complex mixtures, there is always more uncertainty in feeding them to natural children. These liquid foods may be used for a short time for some infants who are unable to digest ordinary milk or milk and starch dietary, but as it is always

more difficult to estimate the value of complicated foods, they should never be used when the starch and milk mixtures give satisfactory results.

### SELECTING STARCH FOR THE INFANT

324. In selecting starch for infantile feeding, only those forms should be used which make the child comfortable and give fairly formed stools. Unsuitable starches will make the child colicky and give unformed stools, even when fed in very small quantities. The error often lies in selecting a malted starch when a baked one should be used, or in selecting a boiled starch when a malted one is necessary, or in selecting a baked starch when a malted one is more suitable. That form of starch is correct which always makes a comfortable baby and gives a formed stool. As the preparation of starch is intended to rupture the little envelopes in which all starch granules are enclosed and partially digest it, this process may not be complete enough to suit the infant's digestive glands. It is therefore evident that the preparation of starch is a very important factor in determining its suitability for each and every infant (639).

325. Very often the form of starch given to an infant is made unsuitable and injurious by not respecting the capacity of the child's stomach in the amount fed at each meal. Every preparation of starch is unsuitable to an infant if fed in amounts beyond the capacity of that special digestive fluid secreted for its conversion into healthy aliment. All foods which enter the digestive tract are either digested or decomposed. That amount of suitable food which is not beyond the infant's capacity at any meal is always digested comfortably and makes the child happy. All excesses of foods, starches or otherwise, which are given beyond the

capacity of the digestive fluid, secreted at that time, must decompose and make the child unhappy and distressed. Excessive amounts of starch produce watery, splashy, scalding, pasty, white or clay-colored stools.

326. Raw or partially cooked starches are always very difficult to digest. They ferment easily and produce sour, gassy, watery stools; but, if fed in a milk mixture, the stools may be foul and sour, due to the decomposition produced in milk when starch ferments. It will thus be seen that, in boiled and baked starches, these errors must be due to overfeeding or the fatty character of the starch when the cooking is properly done. This error is found most commonly in food made from oats and occasionally from barley (217).

327. Starch which is produced by the malting process is relaxing to a great many infants, and can be fed only in those amounts which give healthy formed stools. This relaxing power is a valuable quality, and small additions of malt or malted starch to the dietary generally overcome the obstinate constipation often produced by boiled and baked starches. The process of malting converts starch into a grape-sugar, and this makes a very sweet food suitable for many young infants with very delicate digestive organs (306). Manufacturers claim that no sugar is needed when malted starch is added to the milk diet, but as many infants can take this food in addition to the malted starch, the two foods may be combined when they give healthy formed stools. In the home preparation of the infant's food, starches are obtained from different sources, and they should be selected in that form which is most easily and perfectly cooked (307).

328. The following table shows different forms of starch suitable for the mother's use, the length of time required for cooking and the amount of water needed in the preparation:

## 329.

## STARCHES

	FORM	AMOUNT TABLE- SPOONS	WATER ENOUGH WHEN FINISHED TO MAKE	BOIL HOURS	IN DOUBLE BOILER. HOURS
Quaker Oats.....	Flakes	2	1 pint	$\frac{1}{2}$	1
Rice.....	Grain	1	1 pint	2	3
Durkee's Rice....	Flour	1	1 pint	$\frac{1}{2}$	1
Rice.....	Flakes	2	1 pint	$\frac{1}{2}$	1
Wheat.....	Flakes	2	1 pint	$\frac{1}{2}$	1
Arrowroot .....	.....	1	1 pint	$\frac{1}{2}$	
Tapioca .....	.....	1	1 pint	$\frac{1}{2}$	
Barley.....	Grain	1	1 pint	2	3
Robinson's .....	Flour	1	1 pint	$\frac{1}{2}$	
Robinson's Groats	Flour	1	1 pint	$\frac{1}{2}$	

330. All the above starches, when mixed with milk, are valuable foods to feed to infants. The above proportions are strong enough to use for the first four weeks, or until formed stools show perfect digestion. The strength can then be gradually increased if digestion be perfect as proven by formed stools.

331. As wheat flakes are the only kind of starch in nearly all breakfast flakes, such as "Wheatina," "Pettijohn's," "Ralston," "Boston Brown," etc., any breakfast flake can be used which has not been sweetened or mixed with other ingredients.

332. Combinations of the above starches can be used, when necessary, to change the taste or to correct the condition of the bowels. Any or all of them will loosen the bowels when fed too freely. "Quaker Oats" is the most relaxing one. As the flakes are baked and the flour is fine, these forms should always be used, when possible, as they can be boiled most perfectly and in a shorter time than the whole grains or meals.

## SOUR STOMACH

333. Mothers are very frequently alarmed by the sour character of food vomited. Many look upon this as an error

requiring treatment. Food, when vomited, may be either sweet or sour, according to the length of time since it was swallowed. If vomited immediately after being taken there is little change in it. If vomited later on, between the meals, it must always be sour to be correct. Digestive fluid is necessarily sour when in full activity. As there is no digestive fluid lying in the stomach when food is taken, the food vomited then has not had time to be changed from its original character. Digestive fluid is secreted by the glands in the walls of the stomach immediately after food is taken, and as the amount of this fluid increases steadily until the meal is digested, the contents of the stomach must necessarily be sour until the work is ended.

334. From the above, it will be seen that the sour character is the correct one, excepting immediately after the food is swallowed.

335. There is a condition of extreme sourness which appears in the deranged or irritated stomach and food returned is always intensely sour in these patients. These children have been wrongly or overfed and always require medical advice with lessened or altered diet. This extremely sour condition of the food is usually traceable to excess of sugar or some sweet food. In many cases it is traceable to the excess of Mellin's Food, Malted Milk or any form of sweet proprietary food. Usually, this extremely sour vomiting may occur at feeding time or later.

#### GIVING WATER TO THE BABY

336. There is a very strong sentiment in favor of giving an infant water to drink at all seasons of the year and at all ages. Mothers very commonly ask if it is necessary to do this or they follow this practice without consulting a physi-

cian. During cold weather this subject is of no importance whatever, especially with very young infants, as little or no harm can be done by giving small drinks of water, for infants will not take any more than they desire. Mothers forget the fact that all milk contains seven parts of water for every part it contains of food. This should be enough for any healthy infant. In hand-feeding, milk is still more diluted with water and this may overwork the kidneys in proportion as it is given above the natural needs of the body (289).

337. It is very much better for the mother to err in giving an extra amount of water than to refuse that full amount that the child requires. An insufficient supply of liquid or water causes suffering, mainly during the hot season of the year, or when infants are in some feverish condition (261). There is scarcely any time or condition when an infant should be refused water, but, unfortunately, the cries and demands of a child, especially in hot weather, are not always properly recognized and the mother unconsciously refrains from giving it the drink for which the infant is calling. An infant who is properly fed and yet appears dissatisfied should always be tested with a drink of warm or cold water rather than with additional food. The substance of this subject, then, is for mothers to always satisfy the child with a drink of water whenever she is able to do so, and if this does not give satisfaction, she may then think of feeding it or use some other treatment which may be suggested to her (223).

338. Some mothers prepare a bottle of water, sweetened or flavored in some way, and give this to the infant regularly between meals. This is usually an error when the infant is properly fed. For a well-fed infant, sugar may be beneficial as a food, but persistent overworking of the kidneys

with surplus water must be weakening and injurious to these organs (289).

#### GIVING LAXATIVES TO INFANTS

339. One of the popular practices with mothers is the giving of "castor oil" or "Castoria" to overcome constipation or for the mere sake of being in the fashion of giving something to the infant, ostensibly to relieve colic and prevent green stools. While one laxative is beneficial in the beginning of a sickness where there is fever, the habit of repeating it should be condemned. Laxatives never cure constipation and are never of any benefit to a healthy baby.

They will relieve colic and remove green stools for a few hours, but they will not remove the cause of the colic or green stools. Laxatives may be used to remove the poisonous products resulting from unsuitable food or overfeeding, but when the bowels are very loose, nature is busy removing the results of some dietetic error, and the mother's attention should be given to correcting the amount of food or quality thereof which causes the error rather than persistently giving physic to carry off the results of it. No medicine acts as a laxative upon the bowels except by the irritation which it causes to the whole digestive tract. In doing this, it is acting like the unsuitable food that is creating the damage and injury; consequently, the repetition of anything that acts in this way cannot be other than injurious to the infant.

If an infant is fed correctly, it is always injured by the use of laxatives.

#### TEETHING

340. Dentition, or teething, in the healthy infant, when properly fed, commences about the seventh month and ends



at two or two and one-half years. It is generally understood that infants are more susceptible to disturbances of the digestive organs during the teething period. There can be little doubt of this fact with many children; but there is a large proportion of them who, if properly fed, experience no disturbances of any kind from cutting their teeth.

341. It is generally acknowledged by all that children have little difficulty in teething during cold weather and mothers are only apprehensive on this subject during the hot summer months. A little thought will convince any intelligent parent that nature has not designed teething to be more difficult in itself during the warm weather than during the cold. Of this there can be no doubt; but experience shows that infants do suffer a great deal more from digestive disturbances in summer than they do in winter. This being the case, and teething not being the cause of any extra difficulty in summer, it must be traceable to other errors. This is undoubtedly true and the errors are found in the dietary (269).

342. It is a very important matter for every parent to realize the truth on this subject, because, in following the old inherited idea that all summer diarrheas are due to teething, they fail to give these disturbances that attention which they demand and which they should promptly receive. They are inclined to think lightly of them and wait until the teeth appear before making any effort to relieve the infant of its sickness. In this way they generally allow the sickness to become more severe and the infant to be more and more wasted and debilitated until, too often, it is too late to save the little one's life. When mothers realize that an imperfectly fed infant must always have more bowel disturbances during the hot weather on account of its weaker di-



gestive power, they will be relieved of the great dangers which they believe to be always necessary during the heated term, for these mothers will then learn to promptly lessen the food and increase the water as the weather becomes hotter and when the bowels show an unusual activity, have medical treatment at once.

### HICCUP OR HICCOUGH

343. Hiccup, or hiccough, always appears in children who have been overfed. It is caused by a spasmodic contraction of the diaphragm, and is due to the pressure of a very full stomach against the nerves, or due to fermentation of food in the stomach, swelling it up and giving it an undue size and consequent pressure. Hiccough should always be associated with an overfed condition, and when this appears, it should be a warning to reduce the next meal, and also not to feed quite so liberally. Unless there are persistent and frequently repeated attacks of hiccough, we seldom find any bad results following its presence. The infant who suffers from this disturbance resembles the adult who has taken a heavy Sunday dinner and consequently does not require much supper that day. In this way he usually feels well and has a good appetite for his Monday morning breakfast.

### CRIES OF INFANTS

344. Infants cry from various causes: 1st, hunger; 2d, thirst; 3d, pain; 4th, sleepiness; 5th, wants attention; 6th, wet napkins; 7th, fright; 8th, temper; 9th, uncomfortable position; 10th, uncomfortable clothing.

345. 1st—Hunger. Hunger causes crying before the next meal hour and is accompanied by sucking of the hands and inability to sleep. This cry stops as soon as the infant is fed (256).

346. 2d—Thirst. This causes a continuous cry and worry which is not stopped by food, but immediately ceases when given a drink of water.

347. 3d—Pain. This causes sharp, loud, piercing cries accompanied by such motions as give relief, or increased by such motions as aggravate the pain. This may be due to colic (260), rheumatism, pricking pin, rupture or any form of irritation painful in its character. A very persistent crying or wailing, with no apparent reason for it, is generally due to an earache or swollen gums from approaching teeth.

348. 4th—Sleepiness. This is a very vigorous sharp cry at first, soon accompanied by efforts to sleep, such as closing the eyelids. This cry gradually grows less distinct and lower in character until sleep is obtained.

349. 5th—Wants attention. In some infants this is a most obstinate and persevering cry. It occurs in children after a long sickness where they have received undue care and attention, and it is a natural condition in infants with a too-indulgent parent. They stop immediately when they receive the attention they desire. This never appears in some families, but it always does in others. Every woman has her own way of raising an infant. Many mothers fear to discipline a crying infant lest it become ruptured. There is little cause for this apprehension. Some mothers let the infant cry it out and end the trouble. Other mothers have not the courage to do this and continue slaving for and spoiling the little tyrant.

350. 6th—Wet Napkins. Every mother quickly recognizes this as a cause for crying and corrects it by putting on a dry one.

351. 7th—Fright. An infant may awake from sleep with a loud cry or scream due to some dream or noise. All

frightened infants should be appeased by the mother's presence, either taking it up or turning it over and giving it such attention as she always does to appease it.

352. 8th—Temper. Infants frequently become tyrants and exhibit marked temper when not indulged in everything they desire. It is useless to advise mothers how to correct this. Some can and will do it, and, consequently, have nothing to complain about in the temper of their infants. Other mothers have not the heart or courage to control their infants and so develop an overbearing temper by their indulgence. These mothers usually try to overcome fits of temper in an infant by diverting its attention to toys, to other people, by carrying it around or by giving it all the bric-a-brac in the house to break. On this subject every mother is a law to herself and can not be taught by any outsider (499).

353. 9th—Uncomfortable position. Crying from an uncomfortable position usually occurs during sleep in very young infants. The mother corrects this by turning the child into a new position and by replacing the clothes. This is generally sufficient. The position of the child when awake is changed so frequently that it seldom cries from this cause.

354. 10th—Uncomfortable clothing. A mother very quickly learns to examine the clothing of an infant when it cries obstinately. Most generally, the clothing is uncomfortable on account of being too heavy in hot weather or too light in cold weather. At times clothing is uncomfortable by being too tight at points, and this is corrected by being loosened. Some nurses have the foolish habit of drawing a band very tight around an infant to avoid having the child ruptured. This is a very senseless habit. A band

should never be so tight that the mother's fingers can not slip easily underneath it and also allow room for a large meal. An infant in a very tight band is always in an uncomfortable condition after being fed.

355. Healthy crying is essential for the proper development of the lungs, muscles and chest. This form of crying is not of long duration and it is not necessary to encourage it from a health point of view. All infants do enough of this without being required to do so for health's sake alone. Usually, this occurs most frequently in the evening before being prepared for the night's rest.

#### WASHING THE BABY'S MOUTH

356. There is, at present, a strong wave of teaching in favor of washing a baby's mouth with "boric acid," "listerine" or some other antiseptic solution after each feeding. This, like many other new things in the medical world, has been taken up and advocated more strongly than the necessities of the situation demand. While it would be wrong to condemn this altogether, yet it is the opinion of the writer that considerable harm is done to the delicate lining of the mouth by the intense enthusiasm of many nurses and mothers in their efforts to do something that does not require doing and thus, they claim, prevent it from attacks of sore mouth.

357. If a careful mother gently rubs the child's mouth with any solution in a little absorbent cotton on the end of her finger, possibly no harm will result therefrom, but it certainly does not seem that nature intended any healthy infant's mouth to require washing every time it takes food. The lining of the mouth is always a wet surface and is being continually washed by the secretions flowing from the lining membrane as well as from the salivary glands. This really

seems to be a natural wash designed by nature to do this work. The history of ages shows that this must always have been all the antiseptic necessary. Experience also shows that a healthy, well-nourished child seldom, if ever, has a sore mouth. This disease always comes in infants who are improperly fed and poorly nourished. In these infants, there is at times a tendency towards sore mouth from slight provocation, and possibly washing at that time with an antiseptic lotion, such as a teaspoonful of boric acid in a cup of warm water two or three times a day, will be beneficial.

358. When an infant actually has contracted a sore mouth and shows great difficulty in taking its food, this method of washing it with the finger and absorbent cotton, no matter how gently it is done, is a painful operation. It is infinitely better, when there is any evidence of soreness, to allow the infant to do the mouth-washing with its own tongue. In this way, the work will be done more perfectly and with no pain or irritation to the child. A mixture of boric acid, one part, and powdered sugar, two parts, can be used for this purpose by placing a small pinch of this dry powder inside the lips immediately after each feeding. Any infant, with or without sore mouth, requires to secrete the necessary amount of fluid to dissolve it, and in so doing, this process of dissolving will cause the wash to be effectually applied to all parts of the mouth and the infant will experience no pain or discomfort thereby. This plan of dressing an infant's mouth, whether sore or otherwise, is infinitely superior to any wash, which must necessarily be painful and irritating while being applied in any way. Where an infant is suffering from sore mouth and requires frequent dressings in order to kill germs which are causing the irri-

tation, this dry powder should be put inside the lips every two hours during the daytime. As there is nothing poisonous or dangerous in this application, the amount used should always be increased in proportion to the severity of the soreness.

### NIPPLES

359. There are many patterns of nipples used for nursing infants. Those made of black rubber should be the purest, as all rubber is of that color when in its natural condition. Other colors are produced by some treatment, and possibly, in some cases, by the additions of lead to give sufficient stiffness. The black nipple is the preferable one and the shape and size thereof should conform as much as possible to that of the human nipple. Young and small children use the small-sized nipple, and, as they grow older, the size may be increased. The ordinary cone-shaped nipple, a little broader at the base where it fits on the bottle than at the point, is the most desirable one. Different forms have been adopted by manufacturers in order to overcome the difficulty of collapsing as well as to present other features which are more or less imaginary in the advantages which are claimed for them.

360. The opening of the nipple should be of small size so that, when the bottle is inverted, the milk will only fall in drops from it. Where the hole in the nipple is large enough to allow streams of milk to fall out, the infant will receive its food too rapidly. It seems to be nature's design that the infant should, when taking its food, have the same exercise that the adult requires in mastication. Just as it is necessary for the adult to masticate his food properly, so is it likewise necessary that the infant should labor with its jaws in drawing the milk from the breast or bottle in order to

stimulate that flow of saliva which we use in the mastication of our food. It is not well then, that the infant should be allowed to receive its food too rapidly, for many infants suffer from indigestion and colic through so doing. It would seem as if the salivary secretions are just as necessary for the proper digestion of an infant's food after it is three or four months old as they would be for the same child when it is being fed entirely on a solid dietary (302).

361. Nipples should be removed from the bottle immediately after feeding and put to soak at once in salt or soda-water after being washed on the outside, inverted and washed on the inside also, so as to remove all drops of milk which may lodge there and cause souring of the next food on which that nipple is used. Nipples should always be put in salt or soda-water and rinsed carefully before being again used to feed the infant. Properly kept nipples will last for one or two weeks, and many mothers become so expert with them that they can use a nipple continuously for a month or six weeks.

362. One great difficulty that mothers encounter is the collapsing of the nipple when it becomes soft after being used. This is overcome in the Mizpah pattern by a little valve which allows the air to enter the bottle as rapidly as the food is drawn out. This collapsing tendency can be overcome in any nipple by bending a small wire or string over the edge of the bottle mouth and drawing the nipple over this. In this way the air can enter along the side of the wire or string while the infant is feeding. It can also be overcome by dropping one end of a thin rubber band into the nipple and pulling the other end over the neck of the bottle with the nipple. Any wire, string or rubber which allows a little leakage of air to enter the nipple while nursing will effect this result.



## BOTTLES

363. There are many forms of nursing bottles offered on the market. Possibly the most satisfactory one is the straight cylindrical bottle holding eight ounces, with figures and marks on the side dividing it into ounces and half ounces. This bottle has a mouth large enough to carry a full-sized nipple and also be easily cleansed. There are no angles or difficult places to reach in cleansing it, and consequently, it can be kept free from dirt or sour milk.

364. Many flat, boat-shaped bottles with straight or crooked necks are also used and marked into half ounces, but as they are more difficult to clean, they present no advantages over the cylinder-shaped bottle and are therefore less desirable. A mother should carefully ascertain whether the markings indicating the measurement on the side of the bottle are correct, as they vary to some extent, and frequently an infant, when fed by incorrect markings, may be underfed or overfed and thus damaged.

365. All bottles should be rinsed immediately after being used and then filled with salt or soda-water to await the general washing next morning. They can be washed with brush, shot, gravel or wood ashes and hot water. This can be done more perfectly with a cylinder bottle than with any other shaped one.

366. The necessity of adopting some system by which bottles can be thoroughly cleansed at all times is so important that no mother who understands this subject can, in justice to her own child, omit doing this work thoroughly on every occasion. It is with some difficulty and most absolute cleanliness during the hot weather that bottles can be kept so clean and free from sour milk and other infections that the child will be protected from the ordinary diarrhea



and other diseases of the summer season. One dirty bottle or nipple or one wrongly prepared meal in hot weather is often sufficient to bring on an attack of vomiting, cholera infantum, dysentary or convulsions (281).

367. The old-fashioned bottle with a long rubber tube attachment connected with the nipple is so dangerous and so frequently does it breed sickness that it should never be used at any time of the year or any conditions whatever. It is impossible to clean it perfectly, and enough dirt and souring material will always lodge in the tube to endanger the life of the child who uses it. All bottles should be boiled every morning for at least ten minutes and set on a clean shelf to drain in the inverted position. This can be done in an ordinary dish, if necessary.

368. When a mother desires a more perfect method, possibly Dr. Kilmer's nursing bottle boiler is as convenient and perfect an article for this purpose as we have. It is also a sterilizer and pasteurizer, convenient and inexpensive.

## CHAPTER VII

### THE FEEDING CHART

370. The object of this chart is to educate young mothers to know what is wrong in feeding their children. No mother will allow an error to continue when she knows that it is an error and that it will lead to sickness and endanger the child's life or future health. It is always the continuation of an error which leads to severe sickness and fatal results. Errors cannot be avoided, but their immediate correction is a necessity.

371. This feeding chart contains all those items which the writer has found necessary in feeding, and which mothers show they do not know, but are anxious to learn. It is an explanation of those facts which mothers have asked for and which they have no opportunity of learning in any other way.

372. Experience shows that those who fill these charts regularly soon become very expert and rapid in detecting every change in their babies and also feel independent of those absurd advices and suggestions which are showered upon all mothers. Mothers thus educated can avoid nearly all the serious infantile sicknesses and become the most expert nurses when sickness does overtake them.

373. The filling of these charts educates any mother thoroughly on all the foods and how to use them so as to obtain the best growth and nutrition of her children. Its benefits are applicable to children of all ages.

374. The advantages to the mother in using the feeding chart are very numerous. They are as follows:

1st—The persistence of correctness in work.

2d—Exactness in the amounts of each food used daily and in the size of the meals given to the infant.

3d—Concentration of thought on the points essential and necessary for success.

4th—Attention to details in all parts of the work.

5th—Its educational advantages for present and future use.

6th—A daily reminder of the importance of each feature in feeding an infant.

7th—The independent spirit and self-confidence which it inspires in the mother who fills the chart regularly, as it protects her from the importunities and advices of her friends.

8th—The easy recognition of errors made and how to correct them.

9th—The daily record of the exact condition of the child at any time.

10th—The avoidance of sickness due to digestive errors.

11th—Knowledge and experience thus gained by the mother enables her to prevent many sicknesses in the future and shows her how to feed and nurse her children when they are not in good health.

375. While the filling of the chart is a little confusing for the first two or three days, the necessary thought which it demands when filling it daily soon makes this work very simple and pleasant, and as it compels the mother to watch all the details in the infant's daily progress, she quickly becomes familiar with the work and finds her success unavoidable.

376. When the mother sees that, in recording the results of the food as shown in the stools, weight, sleep, rest, etc.,

she is compelled to think of the reason for every unfavorable answer, she asks herself the question, "Why should not this be as favorable as it was yesterday?" After worrying in this way two or three times, the answer always comes to her readily when she looks at the changes made in the food or the size of the meals on the previous day. It is thus almost an impossibility for an intelligent woman to go wrong in feeding a healthy child if she is careful to thoroughly fill the chart each day. The careful anxious mother is reminded of each and every error she has committed inside of twenty-four to thirty-six hours from the time it is made. In this way, it is almost impossible to continue an error longer than one or two days at most. Errors made in this way can only be small ones and are easily corrected, as the mother can always go back to the last day with a correct formula and good results (220).

377. Each chart is divided into seven columns to be filled with the dietary and child's progress for seven successive days. It is requisite for the mother to fill out all the items in each column daily, and not at any time get into the habit of marking ditto, ditto—simply because it was the same as the day before. This is important, as it compels attention to each feature and demands daily reminding on important points. The reading of the filled lines across the whole seven days of the chart shows at a glance what the alterations have been during the last week and whether the results have been satisfactory or unfavorable. When a mother becomes indifferent to the necessity of filling out each column completely, it is altogether probable that she is not watching her work carefully, and that errors will soon creep in and the infant be more or less seriously damaged by her omissions. It has been the experience of the writer that all successful

mothers take great pleasure and keen interest in filling out each column daily, but where they have neither enthusiasm nor time enough to do this, they should not have charge of the infant's dietary and care. The future health and growth of the little one are of such paramount importance that every person engaged in this work should feel the great necessity that exists of omitting nothing that can be done for the infant's future success, and that success will not be assured by anything less than the fullest attention that can be given to all the details of this very important duty. Any mother who does this honestly and continuously will not be robbed of the privilege of showing a fine, healthy, vigorous baby, equal, if not superior, to that of her neighbors (171).

## FEEDING CHART

Name \_\_\_\_\_ Residence \_\_\_\_\_ Age \_\_\_\_\_

1. Year, 1905..... Month, Aug.....	10	11	12	13	14	15	16
2. Cream.....							
3. Human Milk.....							
4. Skim-milk.....							
5. Whey.....							
6. Lime-water.....							
7. Boiling water....							
8. Sugar { cane.... { milk....							
9. Starch.....							
10. Unused Food....							
11. { Albumen..... { Beef Tea..... { Beef Juice.....							
12. Feed How Often.							
13. Day Meals { No. to 6 A. M. { 6 P. M. { Size.							
14. Night { No. Meals { Size.							
15. Whole Day's Food							
16. Spits.....							
Vomits.....							

## FEEDING CHART—Continued

17. Whole Number of Meals.....							
18. Medicine .....							
19. Number of Stools.....							
20. Color.....							
21. Odor { Natural...							
{ Foul.....							
22. Kind { Splashy ..							
{ Soft.....							
{ Formed...							
23. Colic { Yes.....							
{ No.....							
24. Weight .....							
25. Gas { Natural....							
{ More.....							
26. Gas { Up.....							
{ Down.....							
27. Sleep { Day .....							
{ Night.....							
28. Temper { Good...							
{ Cross ..							
29. Hungry { How							
Before { Many							
Meals { Minutes							
30. Temperature.....							
31. Urine { Natural...							
{ Strong...							
32. Genitals.....							
33. Abdomen.....							
34. Skin.....							
35. Head .....							
36. Veins.....							
37. Flesh.....							
38. Bones.....							

378. Item No. 1—Date. This requires the year, month and day to be recorded.

379. No. 2—Cream. Fat is utilized for heating purposes, the surplus amount being deposited underneath the skin, thus rounding up the child, adding beauty and symmetry to its appearance. One of its main physiological duties is the lubrication of the bowels. This secures a continued

softness of the stools and prevents a dry, constipated condition (243 and 383).

380. Human and cow's milk carry the same proportion of fat—about four per cent., varying in extreme cases from three to five per cent.

381. A quart of milk, when thoroughly cooled on ice at a temperature of 40 degrees, from twelve to sixteen hours, will yield about six ounces of cream (566). Of this cream, the infant will consume during the first few days of its life from two to eight teaspoonfuls daily. It may be increased rapidly during the first month (240).

382. Cream, like milk-sugar, is digested in the upper part of the digestive tract immediately below the stomach; but where it is fed in excessive amounts, or rather in amounts beyond the power of the digestive glands, decomposition results, causing nausea and vomiting. This feature should always be borne in mind, as it will explain the vomiting of meals or a large portion of the food taken at any meal (300).

383. A very popular belief is that cream relieves constipation. This causes many mothers to feed it in excess, not knowing the damage they may cause by so doing. When moderate increases of one teaspoonful daily fail to soften the stools or to move the bowels, further increases are useless for this purpose and likely to be injurious to the digestive power. Few infants weighing from fifteen to eighteen pounds can digest perfectly more than three to four ounces daily (243).

384. It is also thought by many that the cream, or fatty part of milk, is the richest and best food for infants; consequently, very great errors are being committed by mothers and nurses in their desire to give an unusually good nourish-

ing food to the infant. By following this idea they feed it to such an extent that it soon shows decomposition and causes disturbed sleep, restlessness, foul greasy stools, loss of weight and frequently fever also (211).

385. When cream is fed in proper proportions, the stools will retain considerable form. When it is fed too freely, the infant will be gassy, cross and uncomfortable and the stools will become soft, greasy, battery and smell very foul.

386. When fat ferments in this way, it forms acids which are irritating and injurious to the fat digesting glands and the continuation of this excessive error will, in a short time, destroy or reduce their secretions and thus check the child's development and growth for many months or, possibly years. In some cases of extreme irritation, the power to digest fat is permanently reduced (300). From this will be seen the great importance of so regulating the amount of fat in the infant's dietary as to secure perfect digestion with natural stools and thus avoid these bad results (243).

387. We must remember that nature has only provided for four per cent. of this particular element in the human milk diet, and where an excess is great, it must either be carried off by the stools or decompose in the digestive tract and cause sickness.

388. No. 3—Human milk. In prematurely born infants, those with imperfectly developed digestive powers and those whose digestive glands have been damaged by improper feeding, great difficulty is commonly found in framing a substitute dietary which will make them happy, sleep well and increase in weight. These cases should receive human milk for at least a portion of their regular dietary. Too much importance cannot be placed upon this necessity, and it



should be kept constantly in view when feeding infants of this character (198-201).

389. No. 4—Skim-milk. This is the most important item in the infantile dietary. It carries all the proteids, both soluble and coagulable, which are necessary for the infant's growth, development and strength and also four and one-half per cent. of sugar necessary for heating purposes. Out of these proteids, all tissues, muscles and fibers are made and the growth of the infant secured. They exist in human milk in about one and one half per cent. and in cow's milk in three per cent. to four per cent. (150).

390. Skim-milk, in infant feeding, is analogous to meat, eggs and cheese in the adult diet. It usually has a constipating effect, but when it carries a fair proportion of fat or cream, this constipating influence is lessened or perhaps entirely overcome (560).

391. The amount of milk necessary to add to the solution for the daily food varies from two ounces in the infant four to six weeks old to twenty-six ounces in the infant nine or ten months old. Enough must be fed to give the stools formation, and advances in milk for the infant that is growing properly must not be more than two to three teaspoonfuls each week for perfect feeding (231). See schedules 573 to 579.

392. Where skim-milk is fed too largely, it may pass through the infant only partly digested, making dry, crumbly stools, but will most commonly appear in the shape of curds in connection with either well-formed stools or soft, splashy ones. Usually, the stools will be partly formed and the rest of a watery character with foul odors. The infant in this condition will be cross, restless and unhappy. These curds look like beans, peas or pieces of leather of any shape or size,

yellow on the outside, white internally and difficult to break with a match. They are the only hard substances ever found in the milk stool, and when once seen, are quickly recognized. A match should always be used to prove that the substance in the stool is actually a curd until the mother becomes familiar with its appearance.

Where overfeeding is done, the lining of the bowels is irritated by decomposing food. This causes extra mucous secretions which surround little grains of stool as they are formed in the upper bowel, and these appear to the inexperienced mother or nurse like curds. These little yellow grains of stool are very numerous, always soft and easily rubbed out with a match, thus proving they are not curds. This heavy coating of mucous prevents these little lumps or grains of stool from coalescing and forming a natural-shaped stool.

393. An additional way of distinguishing between curds and these small granules of stool surrounded by mucous is by their number and size. Curds seldom exceed two to six in any stool and never show uniformity in size or shape. They are mostly of the large bean or pea size and have irregular outlines. The particles of stool surrounded by mucous, which are so generally mistaken for curds, are usually very numerous and may vary from fifty to hundreds in one stool. They are always small and mostly uniform in size, being about the size of a grain of mustard, wheat or rice. In occasional cases they are more numerous and correspondingly smaller, being not larger than a pin-head.

394. Damages produced by feeding skim-milk in excess so that curds appear in the stool are very serious and exceedingly hard to repair or correct when allowed to continue long. Very commonly the power to digest skim-milk,

when this occurs, is very much reduced or perhaps entirely destroyed (251) and it very materially increases the difficulty in feeding the infant, especially when it is very young. In children six or eight months old, who are able to digest starch this error is not such a serious one as in the younger infants.

395. No. 5—Whey is a portion of the milk obtained by coagulating the casein or cheesy element, with rennet or sherry wine. It may be made from either whole milk or skim-milk and is that portion left when the casein has been removed.

396. When made from whole milk, it contains fat, liquid proteids and milk-sugar. When made from skim-milk, it contains all these foods except fat, and this form must be used where an infant cannot digest cream.

397. Whey is a weak mixture of foods suitable to infants in convalescence from sickness, especially to those who have been overfed on skim-milk and their digestion of casein somewhat damaged. It is a very valuable addition to the diluted cream in infants a few weeks old who are not thriving properly on the cream mixture.

398. No. 6—Lime-water. As milk gradually develops more acidity in proportion to its age; it very frequently, on this account, retards digestion and irritates the stomach of the young infant, thus causing colic or vomiting. This is usually overcome by the addition of lime-water to the milk before feeding. Where lime-water is not added to cow's milk the infant may suffer from indigestion with consequent colic, crossness and disturbed sleep. There is not much need for lime-water in the winter season as cold weather checks bacterial life and consequent souring of milk. Lime water cannot be added when milk requires to be predigested.

399. There is great diversity of opinion regarding the amount of lime-water which should be used, but, usually, it

is unnecessary to add more than one to four ounces to the milk for the whole day. More than that amount may be given with safety, but the above quantities are enough to neutralize this extra acidity in the milk (208), and greater amounts reduce the digestive power. The larger amounts of lime-water should only be used in hot weather. Some infants may be fed without lime-water.

400. As lime-water can never increase in strength by age, it is always safe to use it in the same amounts, whether it is three days or three years old. Water will only dissolve so much lime, no matter how long they are mixed or how much there is present of either of these articles.

401. Boiled water and building lime, mixed together in any proportion, so long as there is enough of each one, will make good lime-water. The water can be poured off after standing three or four days, bottled till needed and more water added to the lime.

402. No. 7—Boiling water. In order to remove all impurities in water, it is necessary that it be filtered or boiled. It is also necessary to dissolve the milk-sugar in the water, while boiling, in order to obtain a perfect and sterile solution of the sugar (206). It is not desirable to mix hot water with milk except during hot weather, when all milk should be pasteurized or sterilized to prevent bacterial growths and consequent souring. These processes also prevent the diarrheal diseases of the summer season, if children are not fed too much. They should always be tried when children are colicky and do not thrive well.

403. No. 8—Sugar. This, like fat, is a heat-forming element in the human economy and the surplus amount of it in the food is utilized in fattening the child and giving it a rosy color. Nature delights in sugars, as shown by

the analysis of human milk. If, out of the twelve and one-half parts of solids in one hundred parts of human milk, seven parts, or more than one-half of the food, is made up of sugar, her preference for this food is very apparent. Human milk contains seven per cent. and cow's milk four and one-half per cent. The sugar solution forms the basis of the food and all additions of cream (fat) and skim-milk (proteid) are made thereto.

404. The prejudices of some people prevent sufficient feeding of sugar, but indigestion and poor nutrition follow the exclusion of this article from the dietary of the infant; in fact, the child cannot thrive, look well and rosy if it does not receive a fair proportion of this food in its daily dietary.

405. Great diversity of opinion exists regarding the suitability of milk-sugar and cane-sugar for infantile feeding. Many of our best physicians are divided on this point. In this, as in many other matters disputed, perhaps the happy medium may and will give the best results. Accordingly, it is desirable, after having reached the highest point in milk-sugar which is suitable to the infant, to make farther additions every few days of one teaspoonful of granulated sugar to the whole day's dietary. As soon as all sugars show the usual sign of fermentation, as described in 409, all increases thereof should be stopped and farther additions to the dietary made in the fat or proteids, but this should not be done before proving that all sugars—milk, cane and grape (malted starches)—ferment in each case.

406. As cow's milk contains only four and one-half per cent. of sugar, it is necessary, when feeding it, to add enough sugar of some kind to make up the shortage of this element in the food mixture.

407. The young infant, during the first ten days of its

life, does not require as much of this article as it does when older. One half an ounce of milk-sugar added to eight ounces of boiled water makes a six per cent. solution which is strong enough for a new-born infant, and when added to seven ounces of water, makes a seven per cent. solution, the usual strength necessary for an infant over ten days old.

408. The usual strength of milk-sugar required for infants over a month old is one ounce to every twenty ounces of the food mixture. When infants digest it well, this may be increased to one ounce in every eighteen, but where it shows any irritation, it must be changed to cane or grape-sugar or reduced to one ounce in twenty-five or thirty ounces, or even less for a short time, but success always demands that it be fed from one-eighteenth to one-twentieth of the whole food mixture when it is well digested. Granulated sugar, when used in place of milk-sugar in hot weather, does not ferment so quickly. When granulated sugar is used, only one half the above amounts is needed, but during the first six months, milk-sugar should always be preferred when it agrees with the infant.

409. Overfeeding sugar causes gas, colic, restlessness and uneasiness. In this condition, the lining of the bowels becomes reddened and irritated, the redness showing externally around the rectum and in severe cases around hips also. Unless the amount of sugar is reduced when this appears, frequent watery, splashy stools with much gas and foul odors will soon follow and the power to digest this article will be more or less reduced (214).

410. Infants very seldom continue to fail in digesting sugar for any length of time. Usually a moderate amount of some kind can be given, but when it has been fed in extraordinary amounts, damage is done thereby. Experience

shows that, even in these cases, by lessening the amount, changing the kind or combining two together, it may be continued in the dietary to a moderate extent at least, and careful use thereof within the bounds of perfect digestion so soon recuperates the digestive glands that it can be gradually increased, so that, in a few weeks, the usual seven to eight per cent. which the child originally consumed can be successfully given.

411. We have no substitutes, either in the animal or vegetable kingdom, which will take the place entirely of sugar, especially during the first three months of the child's life. As soon as the infant is able to digest a small portion of starch, this food can be added, and when necessary, gradually substituted for a portion of sugar (215).

412. When it is found necessary to add starch to the infant's dietary, the amount of sugar in the food must soon be reduced. As starch and sugar are both digested by the same glands (starch being converted into sugar in the process of digestion), the addition of starch without a reduction in sugar often produces fermentation. The approach of this is always recognized by the redness which appears around the child's rectum and also by the extra gas or splashy character of the stools. The reduction or change in sugar is unnecessary before the gassy condition or redness of the rectum indicate imperfect digestion and fermentation (306).

413. Milk-sugar should be bought of reliable quality, such as Merck's, Mallinkrotz' or Squibb's. These grades are all finely pulverized and will require to be packed down close in the measure with the finger in order to obtain the full weight required. Ordinary commercial milk-sugar is cheaper than the above, but is liable to be adulterated. Milk-sugar should always be dissolved in boiling water, and,



where it shows sediment, the solution will require straining before being fed to the infant.

414. No. 9—Starch. In infant feeding, this should be prepared according to directions (329). Where starch-water is used for very young infants of one to three months of age, one teaspoonful may be added to two or three bottles each day as a commencement of this food (304). If it shows no extra gassy condition and consequent colic, it may be gradually added to all the bottles after a two days' trial, and if it continues to show no disturbance in the digestion, the amount of starch water can be increased every two days. It is never safe to make additions to all the bottles in any one day. These additions of starch-water will demand corresponding reductions in the amount of boiling water used in making the daily food. It will soon also demand reductions in the sugar, as before directed (412). It is very often surprising to see how much starch can be added to the infant's dietary before any appreciable increase is seen in its weight. As long as the weight does not advance too rapidly and no disturbance is shown, these additions can be repeated. The form of starch suited to the infant must be selected according to previous directions (324).

415. Where dry crushed starches, such as flour, flakes and proprietary foods, are used instead of the grains, they can be increased by half or one teaspoonful amounts every two, three or four days. These forms must be boiled from one half to one hour in the water needed for diluting the milk (330).

416. No. 10—Unused food. By carefully measuring the amount of prepared food not fed to the baby, the mother always has a record of the whole amount given daily, and in this way, can check any mistakes which may occur



either in the amount of food given or the intervals between meals each day. Where it is necessary to increase the whole amount of food prepared in order to have a sufficiency for the growing infant, all increases in the different foods and water should be shown in their respective places on the day in which they were made. When these increases in amounts are necessary, the chart record cannot be reliable when they are not shown at the correct time. They usually are enough to make one or two extra bottles and can be shown by adding one-eighth, one-sixth or one-quarter to each item. There should at least be enough food made each day for one extra meal, to meet any accident to the bottles.

417. No. 11—Albumen, beef tea and beef juice. These three articles represent the animal proteids which are commonly used as substitutes for or additions to the proteids in skim-milk. They are not equal to the milk proteids in their power to nourish and develop an infant, but can be used as partial substitutes for infants whose digestive glands have been damaged by excessive or unsuitable milk proteids. It commonly happens that these injured digestive glands refuse entirely, or in part, to digest milk; consequently, egg or meat proteids must be used as part or the whole food of that kind (213).

418. Where it is necessary to use these new forms of proteid, they should be commenced in small quantities and the amount gradually increased as long as the stools show healthy formation and give no evidence of irritation by their soft mucous character or foul odors and extra frequency. For the mode of preparing these proteids, see 785, 786 and 788. It must be remembered that most meat proteids will give a dark color to the stool and urine, and always a stronger odor also. Few infants can consume more than'

two to three ounces of beef juice or egg-water daily. Softly boiled egg is more perfectly digested by infants than the egg-water, when they are old enough to take it in this form from a spoon.

419. No. 12—How often should an infant be fed? This is a very important subject. The time chart, showing intervals between meals at different ages, in No. 441, is only a general guide applicable to most healthy children with perfectly developed digestive glands, when their diet is correct in quality and amount, but it cannot apply to infants who are improperly fed, and, consequently, show unhealthy stools.

420. Mothers are usually anxious to increase the size of the meals and also lengthen the intervals between feedings. This is desirable when it can be done successfully; but what does success mean on this subject?

421. Success means to do this and not disturb the infant's sleep, happiness or digestion in any way. When these increases in meals make the infant gassy, cross and restless, or the stools foul odored and softer than formerly, the change is an error (376).

422. Children with weak digestive powers must be fed small meals frequently, and vigorous digesters can take larger meals at longer intervals.

423. The main idea is that every infant must have the largest amount of food every twenty-four hours that it can digest perfectly. If it is a poor digester and very restless, with soft or foul stools, the meals must be at fixed times and small enough to be perfectly digested, showing correct stools (272). This will necessitate meals frequent enough to introduce the amount of food needed for perfect nutrition each day, if possible.

424. Following out this principle allows the good digester

to be fed when he becomes hungry and to take his full amount of food each day in six or eight meals, while the poor digester, of the same weight and requiring the same amount of food, must be fed at a fixed hour and may require his diet divided into sixteen or twenty meals given at short intervals, before he can succeed (230).

425. This necessitates feeding infants, who digest well, in a somewhat irregular way or when they become hungry, as good nursing mothers always do, because the nursing infant does not always take the same sized meal, and thus becomes hungry at irregular intervals; but the infant with foul or unhealthy stools is always getting more of some food than it can perfectly digest. This result demands a fixed time between meals until changes in quality or amount of food have corrected this indigestion and produced healthy stools. When this has been secured, he also can be fed when hungry, as he is now happy and laments only when hungry. Formerly, his cries indicated indigestion rather than hunger and were no guide for feeding.

426. Nos. 13 and 14. This refers to the number and size of the meals used, and is a subject which always requires very careful consideration.

427. During the first month, the healthy infant will require its meals every one and one-half hours in daytime and every three to five hours through the night. With very nourishing and easily digested food, the feeding will be less frequent at night, as the meals can then be larger. After the first month or six weeks, the healthy infant will not require to be fed oftener than every two hours in daytime, every four to five hours at night and less frequently as it grows older. Extensions of time between feedings will always follow with the infant who is properly nourished until,

at six or seven months, it will pass the whole night without being fed and the intervals between day meals will be three to four hours (441).

428. The poorly developed infant and also that one whose digestive glands have been damaged by an improper dietary will require their meals reduced in size and increased in frequency just in proportion to the imperfection and the damage received. Some of these infants will require to be fed every hour in daytime and probably every two hours at night. In very severe cases, it is occasionally necessary to feed as frequently at night as in daytime. This, of course, demands very small meals. This necessity for very frequent meals usually continues only for a limited time.

429. In all infants, whether healthy or damaged, when the food has been properly adjusted to suit their digestive power, it is desirable to feed two different sized meals during the day. When large and small meals are given regularly every day, the mother can always notice which sized meal is most suitable to the infant and gives the greatest comfort, and she can then feed more meals of the suitable size. According to this plan, it is always necessary to have at least two large or two small meals given every day and the results shown by the infant will guide the mother very largely in the future sizes and the amount of food which is most suitable to the infant's digestive power. This plan makes the child happy while awake and gives comfort and continued sleep during the night. These meals should vary from one half to three quarters of an ounce in size.

430. Nursing mothers always recognize the difference in the size of the meals which their children take when they are healthy. No mother will tell you that her infant always nurses the same amount at each meal. Her universal testi-

mony is that the infant, at times, will take large meals, and at other times, she will say that it is not hungry, as it did not nurse much. This applies to all humanity. We all know that there are variations in the amount of food which we consume at different hours of the day. As the nursing infant varies in this way, is it not reasonable to suppose that the hand-fed infant should be given the same privilege? It seems only prudent to give the infant the same relief that we all claim when we have taken an unusually large Sunday dinner and then entirely refuse our evening meal, or at most, make it a very light one indeed.

431. Where only one sized meal is fed, the complaints of the infant are nearly similar all the time, and there is often great difficulty in deciding whether the infant is receiving too much or too little food. It is a very common thing, then, to mistake complaints resulting from hunger for those made when the child is suffering from colic. On this point, mothers continually complain of their inability to realize exactly what is wrong, but different sized meals remove this uncertainty by showing which sized meal gives the most comfort. The complaint from hunger usually results from the small meal and that from indigestion and colic from the large meal (473).

432. The sameness in food, as well as the amount thereof, is not conducive to that stimulation of the stomach which will be obtained by occasional large meals, demanding extraordinary effort on the part of the stomach to properly digest them. Nature has made provision in all the glandular organs of the body to perform extraordinary labor at times. This is accomplished by an extra supply of blood to those glands when they are called upon to do this extra work; but as the rule in this is the same as in other parts of the body,

extraordinary effort should be followed by corresponding rest (210).

433. When a one sized meal is continuously the rule, the great danger is that, in the desire to feed the child all it can digest and make it grow rapidly, all the meals will be so increased as to permanently reach the point of always giving too large meals. This is the actual condition which we continually meet in hand-fed children and is what causes so many infants to suffer from colic, gas and foul, frequent stools, and is also the cause of marasmus which kills thousands of children every year (289).

434. The rapid increasing of meals or sudden change of food imposes extra burden or labor on the digestive glands which they strive to accomplish, and, in so doing, demand an extraordinary supply of blood. This extraordinary circulation in these glands is steadily increased by their efforts to digest too large meals until this circulation reaches an inflammatory point, when nearly all the secreting power of these digestive glands is checked or lost. At this point, and from this condition, we have attacks of acute indigestion, fever and vomiting which commonly result in diarrhea or dysentery.

435. By using different sized meals, these digestive glands are rested after doing extraordinary labor and the happier condition of the infant with less gassy eructations from the stomach or discharges from the bowels, and, consequently, better sleep clearly show the mother that the infant is more comfortable on some small meals than it is when all meals are made large.

436. In this way, the mother is continually being educated regarding the ability of her infant to digest its food, the size meals it can digest with comfort and the benefits it

receives from resting the stomach with smaller meals at certain hours of the day. The mother can also see that the infant's digestive power is continually being stimulated and the stomach gradually developed by extraordinary efforts followed by periods of rest.

437. The night meals, in young infants, during the first six months, should always be from one half to one ounce larger than the largest day meal. This ability to take larger meals is due to the fact that the long hours of sleep afford more time for digesting the food, and the very empty condition of the stomach after a long sleep demands a larger meal in order to satisfy the increased cravings of hunger. When an infant does not receive these large night meals, it will awaken more frequently and demand a greater number of meals. An infant during the first six or eight months can always digest larger meals at night than in the daytime. This, of course, applies mainly to infants who are fed properly during the daytime (429).

438. It must not be thought from this that large meals are all that is necessary to secure good sleep at night. It is equally important that the infant receives its full number of meals during the daytime, even if it has to be awakened in order to take them. The infant who is not fed regularly in daytime does not receive sufficient nourishment to prepare it for the night, and, consequently, will awaken frequently and demand extra feeding to make up for every deficiency during the day hours. Just as the mother takes her meals regularly and consumes a regular amount of food daily, so must the infant do likewise. Enough food is demanded every twenty-four hours to nourish the body. If it is not given in daytime, disturbed sleep demands it during the night. This rule applies to nursing as well as hand-fed infants (84).



439. Where healthy infants are allowed to be hungry only five or ten minutes before the next meal during day hours, they very soon commence to refuse night meals. When night meals are refused by infants, special care must be taken to see that this amount refused at night is gradually added into the day meals. If this is not attended to, the infant will very soon demand the night meals again. About three days are necessary to transfer a night meal into the day meals.

440. Infants vary considerably in the rapidity of their digestion at different hours of the day, and the intelligent mother very soon recognizes those hours where it is desirable to vary the time of feeding a little or vary the size of the meal in order to secure that amount of sleep necessary for the child's happiness and comfort.



441. The following table will give a fair size and also intervals between meals: Suitable for average sized babies; small babies will require less and larger ones more.

Age	Number of Feedings in 24 Hours	Interval Between Feedings, Hours	Night Feedings (10 P. M. to 7 A. M.)	QUANTITY FOR EACH MEAL		Quantity for 24 Hours, Ounces	Will Suit Babies of Pounds
				In Day-Time 6 A. M. to 6 P. M. Ounces	During Night 6 P. M. to 6 A. M. Ounces		
Third to seventh day.....	10	1½	2	1 to 1¼	1¼ to 1½	10 to 15	7 to 7½
Second to third week.....	10	1½	2	1½ " 2	2 " 3	15 " 30	7½ " 8
Fourth to sixth " .....	9	2	1	2 " 2½	3 " 3½	22 " 32	8½ " 9½
Sixth week to third month	8	2½	1	3 " 3½	4 " 4½	24 " 36	9½ " 12½
Third to sixth month.....	7	3	1	4 " 4½	5 " 5½	28 " 38	12½ " 15¾
Sixth " ninth " .....	6	3	0	4½ " 5½	6 " 7	33 " 42	15¾ " 18½
Ninth " twelfth " .....	5	3½	0	5½ " 6½	7 " 8	37 " 45	18½ " 22

(See 427)

442. The above meals of bottle food will generally contain only milk solution during the first three months. During the second three months, they will also contain a starch solution with the milk (304). From the sixth to the ninth month, there must be a liberal addition of starch to the mixture and some bread and cracker crumbs (303), and during the last three months, in addition to the starch and milk solution in the bottles, infants must be taught to eat bread crust, crackers and other solid starchy foods in increasing quantities as they become older (771). It will not be necessary at any time to increase the bottle food more than above shown at the twelfth month, as all increases in food after twelve months must and should be entirely in the line of solid articles, so that the healthy infant at fifteen months will be on a practically solid dietary, only drinking the necessary amount of water and milk requisite, but not in excess of what it took when a year old (735).

443. No. 15—Whole days food. This is a very important and useful space to fill in daily, as it shows at a glance what changes are made in the amount of food. This becomes a valuable check upon those irregularities in feeding which always mean failure, such are those that show variations up and down of one to three ounces daily.

444. When the child is progressing satisfactorily, the increases will be very gradual, or there will be no increase whatever when any one of the items 2, 3, 4, 8, or 9 show an increase or when the 7th item shows a decrease; in other words, for success in infantile feeding, the chart of a growing infant must never show more than one change in any one day. By following this rule, the error which follows a mistake can always be traced to its origin and corrected (376). Where two or more changes are made in any one

day and the stools show that an error has been made, it is impossible to know exactly which change has caused the error. Only in underfed infants with healthy stools is it safe to make additions to the dietary in more than one point in any day.

445. Where, then, increases are made in item 15, they must not be greater than will give correct increases in cream and milk (240 and 241).

446. When irregular feeding is indulged in and the number of meals varies daily, these figures showing the amounts of food fed will at once warn the careful mother of the enormity of the error she is making.

447. No. 16—Spits. Spits is commonly used by mothers to explain that small amount of food returned occasionally by the infant whose stomach has been well filled. Mothers when asked to explain what amount they mean by this word, usually say a very little, half to one teaspoonful. This amount usually comes up with the necessary expulsion of gas immediately after taking a meal or at some interval between meals.

448. Spitting is evidence of a full stomach and should be looked upon as a measure of the child's stomach capacity, for it shows that the infant will take care of that amount of food which reaches the spitting point, but that more will cause vomiting. It is always desirable that mothers feed their infants large enough meals to cause this occasional spitting, as that is an assurance to them that they are feeding the full amount which the stomach can contain.

449. Very commonly, it will be noticed that this spitting is frequently repeated and may amount to vomiting, but nothing is brought up excepting water. Where this is the condition, it shows that the food is too dilute and that the

child would thrive better with food containing less water. It is not desirable to feed meals large enough to make the child continue spitting after every meal, because such feeding invariably leads to indigestion, colic and disturbance of the bowels.

450. Vomits. Vomiting is usually caused by too large a meal or by the too large amount of fat or sugar which the meal contains. Vomiting of food implies that the child throws up a large portion of each meal and should be looked upon, in the hand-fed infant, as an unfavorable and undesirable condition. Hand-fed infants who vomit frequently never thrive well. They always lose a large portion of their food and also sacrifice a great deal of the digestive fluid required for their proper nutrition.

451. Vomiting immediately or very shortly after the meal is mostly due to the size of the meal (257).

452. Vomiting from one-half to one hour after the meal has been taken usually occurs in large amounts and is due to the amount of water, fat or sugar in the food (259). This is always an unfavorable condition and leads to poor nutrition and a pale, yellow infant when continued. From the above, it will be seen that vomiting in hand-fed infants always demands lessening in the size of the meals or smaller amounts of water, fat or sugar in the meals.

453. The nursing infant can often continue to vomit freely immediately after meals and still thrive well; but the hand-fed infant cannot do this. The difference lies in the quality of the food.

454. No. 17—Whole number of meals. Where the mother is experienced in feeding her infant there is no necessity for this item, as such a mother never changes the number of meals fed each day to her infant excepting to

lessen them gradually as the infant grows older and thrives satisfactorily. To the inexperienced mother, it is desirable that this item be filled in regularly, so that, in doing so, she will realize or see that she is making a serious mistake when, for any reason, she has been induced to give an extra meal. Regularity in the amount of food (number of meals) is absolutely essential for success in a healthy infant. They can be varied in size (429), but the properly fed infant with healthy formed stools can never be otherwise than injured when extra food is given during any day. It is just as important that the healthy infant's meals be a fixed number daily as it is that the mother's meals be a fixed number each day. The mother must expect, when she varies the number, that the infant will suffer from the same disturbing symptoms that she does herself when she eats more than her usual amount of food in any one day.

455. An occasional necessity for an extra meal, but only a small one, may occur. This happens when weaning or changing food, and the new food is given very sparingly till stools show its suitability. As changes of this kind always demand small experimental trials in the beginning to prove that the new food is suitable for the infant, it generally happens, during these changes, that the dietary is not sufficient to nourish the infant properly and the child may be unable to sleep continuously. Where the infant acts in this way and is not suffering from gassy disturbances, it is evident that hunger is the cause. Under those conditions, it is always prudent for the mother to give an extra meal from one-half to one hour after the previous meal, to the wakeful, crying infant. This extra meal should not be the full size of the regular meal and is, largely, a test of the child's condition. Should the infant be able to sleep quietly and com-

fortably after this extra meal, it shows that the amount of food given during the previous day or days has not been sufficient and will call for a general increase in the size of the meals.

456. No. 18—Medicine. With infants properly fed, this item needs no attention. With infants whose digestive organs have been crippled or damaged from any cause, the physician in attendance may order certain remedies and this space gives an opportunity to record such medication.

457. All the explanations in the previous seventeen items relate to the food and proper ways of giving it.

It will now be necessary to look at the results produced upon the infant by the food which it has received. The remaining items to be considered will bear upon these effects, and from the facts shown in them will be seen the correctness or errors which result from the way in which the instructions in the previous items have been carried out.

458. No. 19—Number of stools. Here is a result which must be carefully and continuously observed for correct infantile feeding.

The nursing infant who is entirely dependent upon its mother for its food has frequent stools during the first month or two of its life, gradually growing less in number until the infant is eight or ten months old, when it generally has one or two stools each day.

459. The hand-fed infant, on properly modified milk suitable for its steady growth and development, should have only one, or at most, two stools each day after the first month. When there are more than this number, infants seldom thrive properly (468). Where the stools always show formation, there may be two, three or more daily, as

the number of evacuations is not important when the quality is correct.

460. No. 20—Color. Infants properly fed upon modified cow's milk produce stools of light yellow or lemon shade. Where the proportions of cream or fat are too high, the stools assume a buttery, creamy or greasy appearance and are of a soft or ropy character with foul odors (385).

461. Light or white-colored formed stools usually are short of fat, and when dry and crumbly or green and slimy, carry too much proteid, that is, skim-milk (263).

462. Soft, light-colored stools usually carry too much milk or boiled starch. This color is thought by many to be due to an inactive liver, but a reduction in these items generally corrects this color (325).

463. Starchy foods, when well digested, always darken the stools (263).

464. No. 21—Odor. When food is properly digested, there is very little decomposition, and consequently very little odor to the gas or stools when passed from the bowels. When this natural condition exists, the child always grows well and is happy, if it receives enough food.

465. Where the stool or gas is of a very strong, foul odor which permeates the whole room, it shows that, at least, a portion of the food is decomposing instead of being properly digested. These children also discharge a great deal of foul gas which so permeates the room and clothes that it is usually thought the bowels have moved. Where this condition exists in infants, they are always cross, restless, sleep poorly and do not thrive well.

466. No. 22—Kind of stool. Splashy stools that spread all over the diaper are always the result of fermentation or decomposition of the sugary or starchy food or some part



thereof. These stools are usually numerous and indicate a poor digestion or unsuitable dietary. Children having these stools never thrive, and have all the characteristics of sickness. They always lose weight and suffer from absorption of decomposed food products. Their blood is constantly in a poisoned condition and their kidneys are always strained in removing this poison. Constant feeding of this kind usually damages these organs and lays the foundation for future diseases (698).

467. Soft stools. Soft stools, except during the first few weeks, are generally foul and more numerous than desirable. They indicate an imperfect digestion or unsuitable food proportions. These stools seldom allow an increase in the weight of the child.

468. Formed stools. These are usually proof of good digestion, and when of the proper density and color, guarantee the successful growth and development of the infant. There are not more than one or two daily and may require the use of the soap stick or enema to move the bowels. When formed stools are of a white color and are crumbly and dry, they show a shortage of fat in the food or an excess of proteid or starch. Changes in the food should be made in the directions thus indicated to improve their color and consistence (263).

469. The proper consistence of the stool is important. It should be about that of cold lard or butter and cut clean and square with a match. When it drags in cutting, it usually contains too much fat or cream for successful feeding. Slight variations from this consistence do not always mean failure in the infant's growth. When dry and crumbly or grainy in character, the diet usually carries too much proteid or starch.



470. No. 23—Colic. This is generally the result of fermenting or decomposing food in the bowels. This fermentation may be caused by too much of all or any one food in the substitute dietary or by different external forces which produce changes in the mother's milk or in the child's digestive secretions. Too much heat or cold and quick climatic changes, such as windy exposure, often cause colic also.

471. Where it results from the quality of the mother's milk, it may be due to her continuous inability to secrete a milk carrying sugar, fat and proteid in proportions suitable to the child's digestive power. Faulty milk may be due to errors in the food which the mother consumes; to extraordinary labor on her part; to mental worry; to irregular nursing, or nursing too freely; to sickness or exposure to cold, or any force which temporarily interferes with or checks the proper proportions in her milk. Where the mother's milk continually produces colic in the infant, the propriety of weaning should be carefully considered. Where a mother ordinarily secretes good healthy milk which produces healthy yellow stools, colic in the child can usually be traced to some error or change in the mother, and as soon as this is corrected, the colic disappears. All hand-fed infants are subject to colic equally with the nursing infants when errors occur in the dietary (39).

472. Colic often results from an imperfect digestive power. Infants, suffering in this way, may be divided into two classes: The first of these will comprise infants born with weak digestive glands, and the second are those in whom sickness temporarily weakens the digestive secretions.

To the first class belong all those children inheriting constitutional taints and those with imperfectly developed di-

gestive glands. Among these are the children born of nervous, dyspeptic, alcoholic or syphilitic parents. Children of syphilitic parents are always very difficult to nourish and almost impossible to raise without human milk. Many children of alcoholic parents and of mothers with poor exhausted constitutions suffer much from weak digestive power and consequent colic.

In the second class are those suffering from some disease. In almost every sickness there is a reduction of the digestive secretions, and unless the feeding is carefully reduced according to this decreased digestive capacity, colic with green, mucous stools is sure to follow, very much aggravating the original sickness and thus decreasing the child's prospect of recovery.

473. There is one condition which is very frequently confused with the colicky one and which simulates colic more closely than any other. This is the complaint which the child makes when it is hungry. In the hungry condition, the child's motions are somewhat similar but not so violent as in colic, and the crying is not of the decidedly spasmodic and intermittent type. The cry of the hungry child may be loud and strong, but it is an almost continuous one of the same severity and stops immediately when the infant is fed. On the contrary the cry of the colicky child is not appeased or checked by food. The infant may, and often will, take food or drink when suffering, but will often stop and cry while drinking. Additional food aggravates rather than relieves the pain of colic.

474. A summary of the differences between colic and hunger would be as follows:

In colic, loud, intermittent cries with periods of rest between many cries; violent motions with the legs and body;

relief after the expulsion of gas or stool, also from warm applications and rubbing externally or by giving warm aromatic teas, whiskey or gin internally, but no relief from the food which has been taken.

Hunger is recognized by the continuous fretful crying of the infant, without any intermissions of rest, until fed. Warm drinks, applications and rubbing irritate the infant or only give relief for a few minutes and nothing satisfies the cry from hunger except food (345).

The infant with perfect stools very seldom suffers from colic.

475. No 24—Weight. The infant averages about seven and one half pounds when born. The same infant, when properly fed, will average from twenty-two to twenty-four pounds when it is a year old. This leaves an average of sixteen pounds to be gained during the first year (244).

An average increase in weight of healthy nursing infants:  
During first 3 months; 7 oz. weekly or 91 oz.

"	second 3	"	5	"	"	"	65	"
"	third 3	"	4	"	"	"	52	"
"	fourth 3	"	3	"	"	"	39	"

---

247 " or 15 lb. 7 oz.

Birth weight

7 " 8 "

---

An average weight at one year old 22 lb. 15 oz.

The ability to take solid food after seven or eight months, accounts, frequently, for an increased growth during the last quarter of the first year.

476. Hand-fed infants usually do not thrive as rapidly during the first six months as nursed infants, but gain more quickly during the last half of the year so that, when a year

old, if properly fed, they weigh as much as the nursed infant.

477. The above figures showing increases in weight are only obtained where the feeding has been continuously right from birth. Where none of the digestive glands in an infant have been injured by the use of unsuitable mother's milk or by unsuitable foods of any kind, it is easy to adjust the amount of fat, sugar, proteids and starch so as to secure those regular and steady increases in weight which always make a child comfortable and happy; but where errors are committed through an unsuitable dietary and the resulting attacks of indigestion cause disturbed bowels, the losses in weight thus produced are very slowly retrieved even with good feeding (270). It requires only a very little error in the dietary to prevent the infant's growth and set it back for a month before it again shows steady advances in weight. So important is it to avoid committing these errors that regular weighing of the infant cannot be too firmly insisted upon.

478. The regular weighing of an infant is an absolute necessity to show its progress and indicate the amount of food needed each day. The old practice of weighing an infant once a week or month is not enough to guard against mistakes. It is certainly no satisfaction to find, when the child is weighed at the end of the week or month, that it has not gained or has been losing weight most of the time since it was last weighed (486).

479. In order to do good work, the mother should weigh the child at least twice a week. To be perfectly sure of the infant's progress and avoid damages resulting from unsuitable dietary, it is better to weigh it every day immediately before its bath. When an infant is increasing

steadily in weight, the scales will show the daily changes in a very erratic way, gaining or losing from one-half to two ounces daily; but in satisfactory progress, the losses will be less than the gains. This erratic progress in weight, where an infant is thriving steadily, is due to the length of time since last feeding, urination or stool. As this varies every day, it is inevitable that a good pair of scales must always show an erratic progress either upward or downward. Where the scales show that the child is not gaining in weight or that it is losing a little, it is evident that the infant is either not getting enough food, or the food, if abundant in quantity, is unsuitable in quality (244).

480. Where the infant is cross, restless, uneasy and does not gain in weight but still shows healthy well-formed stools, with freedom from gas, it is evident that the food is correct in quality but not sufficient in quantity (255). But where, on the other hand, the child is unhappy, restless, gassy and uneasy and the stools are too numerous and bad in quality and odor, it is equally evident that the failure in weight is due to the quality of the food.

481. Regular weighing is so important that every mother should provide herself with a set of scales. The weight must be shown in half ounces or ounces and the scales act quickly, so that only a second or two are required to see the advances or losses.

482. A good pair of scales are absolutely essential for success in feeding an infant, but are very seldom needed where the child is properly nursed by the mother; in fact, they are never required when the mother's milk is correct in quality and amount, but their use is a necessity where an infant is not happy and does not sleep or grow satisfactorily.

483. The expense incurred in buying the scales should

never be considered, as they will more than repay this many times over in avoiding those sicknesses sure to follow over-feeding or unsuitable food.

484. Where an infant is not increasing in weight regularly, the scales point this out clearly, long before the parents see it. This enables them to increase or change the food and thus avoid errors in nutrition with the diseases resulting therefrom.

485. As the weighing of the infant is important only to show its progress, a scale that can be used regularly with little trouble and also one which occupies little space is necessary. It should have a platform on which a basket can be fastened securely. In this basket the infant can be placed and the revolving dial on the face of the scale will at once show the exact weight in half ounces or in ounces. Such a scale can be bought for one dollar. The cheap scales which are held in the hand and suspend the child from a hook are not reliable and should never be used. The ordinary grocer's scale will also do this work correctly.

486. The regular weighing of an infant, then, is essential and a necessity in all conditions excepting that one where human milk is entirely satisfactory.

487. No. 25—Gas. There is always a natural amount of gas in the stomach and bowels of an infant. This seems to be part of nature's plan in order to retain a somewhat even-sized abdomen at all times. When food is taken into the stomach, there is distention of this organ in proportion to the size of the meal, and the result is that the first contraction in the process of digestion expels a sufficient amount of gas to make room for the food. This causes belching once or twice after feeding and should be considered natural and healthy.

488. Frequently a mother is too hasty in putting her infant in the cradle after taking a meal and before this gas is expelled; consequently, it feels uncomfortable until raised up and the gas allowed to escape.

489. Parents often complain of their infants having a great deal of gas because they hear it rumbling around inside of them, though it is not being thrown out. This complaint is not always an evidence of indigestion, as hungry infants will show this same noisy, gassy condition.

490. Only that extra gas which is thrown out from the mouth or rectum can always be looked upon as reliable evidence of an unsuitable dietary.

491. No. 26—Gas, up or down. When fermentation of food occurs in the stomach, it produces belching of gas, more or less continuously from one meal to the other. This is usually due to the extra large size of the meal. It may also be due to the quality of the food, but most commonly results from the extra amount of food.

492. Nature gives the digestive glands power to secrete a definite amount of digestive fluid after each meal. When the food is greater than this amount of fluid will digest comfortably, continued fermentation and consequent belching always follow.

493. The same principles regarding gassy discharges from the stomach apply to the bowels also. There is always a natural amount of gas passing from the bowels of the healthy infant which causes neither pain nor inconvenience; but, when there is a continual or frequent passage of gas in this way, it shows that a portion of the food is decomposing below the stomach at some point in the intestinal tract. If this gas is accompanied by very foul odors, the inference is that part of the animal food, such as the cream



or skim-milk is decomposing instead of being digested. In this case, the infant suffers a good deal from colic, and the stools are numerous and soft with an increased amount of mucus. Generally, they are green or mixed in color.

494. Starch is capable of producing more gas than any other food and a reduction in this item usually is followed by a corresponding reduction in the amount of gas discharged.

495. Where an infant is partaking of a mixed starch and milk food and there is not much odor to the extra gas that is thrown out of the bowels, the error probably lies in the amount or character of the starch which is consumed.

496. No infant can be happy and grow well who is suffering from constant belching or rectal discharges of gas.

497. No. 27—Sleep. A new born infant should sleep twenty hours in every twenty-four. As it grows older the hours of sleep are gradually lessened while it is in a perfectly healthy condition. Where the food is not suited to the infant and the digestion is imperfect, the sleep is very much disturbed. The infant who is not gaining in weight seldom sleeps well. There is no feature of the infant's condition which shows errors so quickly as disturbed sleep. Every mistake in the dietary of the healthy child is immediately manifested by some disturbance in this feature. The infant either sleeps too much or too little, too long and heavily or is unable to sleep continuously, waking every few minutes and crying out in its distress. Imperfect nutrition in the infant is always evidenced by disturbed sleep. This is always the first feature giving evidence of an error and always the last one to be removed after the errors in nutrition have been corrected. An infant very readily acquires the habit of disturbed and irregular sleep, from which it is very diffi-



cult to escape. There is no feature in an infant's character which it is so difficult to correct. It is amazing at times to find how much of this disturbance an infant will endure and yet, apparently, thrive moderately well. Good sleep is generally an evidence of successful nutrition and infants who sleep well usually grow and make weight steadily.

The following are the most frequent causes of disturbed sleep:

1st—Unsuitable quality of food.

2d—Too much food.

3d—Too little food.

4th—Gassy accumulations in stomach or bowels.

5th—Imperfect nutrition.

6th—Habit of waking.

7th—Too much heat.

498. Medical treatment is never successful in correcting the wakeful habits of imperfectly nourished infants. Only good health, an increase in weight, fresh air and sunshine will ultimately succeed in removing this very annoying and trying habit.

499. No. 28—Temper. An imperfectly fed infant is always cross and troublesome. While it is an unpleasant thing to have a child cross and unhappy in the daytime, it is very much worse when this condition is extended into the night. This disturbed sleep and cross, restless habit of the infant is an indication of an error somewhere, and usually, it is found in the wrong or deficient diet of both nursed and hand-fed infants. The errors in the mother's diet, labor, mental condition and health are generally transmitted to the infant through the milk supply. All errors which disturb the infant in sleeping hours also have the same effect during waking hours, and cause crossness and irritability. These

errors may be due to the quantity of the food as well as the quality.

500. It is a common thing to hear a mother speak of her baby as being a very cross one; or, in fact, claiming that all her children are cross; not realizing the fact that this crossness is a matter entirely of her own making (352). The natural condition of every infant is to be happy and good natured; but, to secure this, the general care and feeding of it should be uniform and correct whether nursed or hand-fed. The infantile constitution is very much opposed to irregularities and very sensitive to errors, and the only way it has of showing these errors is by that crossness which is always natural under unsuitable and unhealthy conditions. There is no such condition as that of a naturally cross yet perfectly healthy and properly fed infant.

501. No. 29—Hungry before meals. This is a very important feature to be observed in hand-feeding. Without a proper recognition of what this means and a strict observance of its necessities, there can be no success in feeding an infant. Where the food is entirely suited to the infant's digestion, the child will remain happy and comfortable only just so long as the stomach is properly occupied in digesting food. As soon as the meal is completely disposed of, it again becomes hungry, restless, uneasy and cries for more food. When the meal is large enough to satisfy the demands of the stomach to within five or ten minutes of the next feeding hour, the child will be happy and grow regularly. Where it becomes hungry, restless, uneasy and cries out for food but is compelled to wait more than five or ten minutes for the next meal, it will fail to make weight just in proportion as that time is longer than the regular five minutes necessary for success.

502. An infant who becomes hungry and habitually cries for its food fifteen to twenty minutes before the next meal, even when fed most suitably and perfectly, cannot make weight (654).

503. An infant who is persistently hungry and cries twenty to thirty minutes before the next meal is losing weight rapidly (654).

504. An infant who does not become restless and call for its food at least five or ten minutes before the next meal is usually overfed, and persistence in feeding amounts which are not completely digested before the next meal is given, as is shown by the child's failure to demand another meal, is very likely soon to cause indigestion, producing decomposition or fermentation of a portion of these too large meals.

505. There is only one true way of gauging the amount of food which should be given at each meal, and that is to have it that size which will make the child hungry and call for food five minutes before the next feeding. This is very easily regulated by the mother, as she very soon sees that one or two spoonfuls more or less in the meal usually varies the time at which the infant cries for the next feeding. When the meal is a little too small and the child becomes restless twenty minutes or one-half hour before the next meal it is always better to feed at once rather than hold to a fixed rule for time of feeding. An intelligent mother always exercises that elasticity of ten or fifteen minutes before or after the usual hour of feeding when she sees this is necessary to keep the child comfortable and happy. This privilege of feeding when an infant is hungry can only apply to those who digest perfectly and have perfect stools, as they only cry and worry when hungry. The imperfectly fed infant is

cross all the time and no one can know when it is hungry. It must be fed at fixed hours.

506. No. 30—Temperature. In the healthy and perfectly fed infant, the temperature is not a subject that often requires consideration. Where this varies enough to cause restlessness, the extra heat of the infant will give warning of sickness. As the child in a feverish condition can never digest as much food as when healthy, it is always necessary that the meals should be reduced in size as soon as there is any fever. This is an absolute necessity in order to avoid complicating the approaching sickness by adding a disturbance in the digestive organs also.

507. As overfeeding and unsuitable food are common, and the most frequent causes of fever in infants, it becomes necessary to promptly reduce the food always and thus avoid increasing the fever, especially when errors in the dietary have been the cause thereof.

508. The amount of reduction should always be liberal enough to give relief by lightening the work of the digestive glands. This will demand a reduction of at least one-quarter, one-half or even three-quarters in the size of each meal. Just in proportion to the height of the fever is the restlessness of the child and the necessity of reducing the food. When this reduction is made, there should be a corresponding or greater addition in the amount of water to replace that food which has been removed. These temporary changes or reductions should be promptly made by the mother, not waiting for advice from the physician. Where fever is very high and the child nervous or the bowels disturbed, all food should be stopped for a few days or until the fever subsides. It should be a standing rule to cease feeding entirely when there is doubt about the severity of

the attack. Food should never be given during a feverish condition in the beginning of any sickness (261).

509. It is an impossibility for any mother to nurse her sick infant properly when she does not know the variations in temperature which are produced by sickness.

510. The habit followed by some mothers of continually testing a healthy child's temperature with a thermometer, as a means of knowing whether it is sick or not, is not productive of good results. Parents, working in this way, concentrate their whole thoughts upon a child's temperature, as if this was the sole indication of its health or sickness. This is an error and should not be followed. The instinct of the mother or nurse, handling the child all the time, enables her to judge of its condition from every point of view, and thus she recognizes the sickness from disturbances in sleep, loss of appetite, thirst, restlessness, crossness, loose bowels, vomiting, cough and every other unnatural feature as well as fever also.

511. During sickness, the thermometer is an absolute necessity to guide the mother in her treatment of the feverish child. Without it, there is no possibility of knowing at all hours how much bathing, cold dressing, food, drink or medicine should be used or given. With the thermometer, the directions of the physician can be clearly and intelligently carried out. In selecting one, a half or one-minute thermometer should be preferred.

512. The temperature of an infant should always be taken in the rectum. It can not always be taken correctly at any other point in the body and very serious errors frequently follow efforts to take the temperature in the groin under the arm or in the mouth. The temperature of the rectum gives the only true record of the child's fever.

513. No. 31—Urine. This is an item which varies continuously with the characters of the food. It always becomes dark colored and smoky when beef juices are fed. It also varies according to the amount of food and the perfectness of digestion. The principle feature noticeable is the dark color and very strong odor which the urine emits when an infant is overfed. This is due to the absorption of imperfectly digested or poisonous products of food which are eliminated through the kidneys and thus cause this strong odor, just as fermenting or decomposing food causes foul, gassy stools. This condition should always be an indication to reduce or change some part of the dietary. Urine of this character is very likely to scald the infant and cause a frequent desire to urinate and also make the infant nervous and restless in the daytime, with disturbed sleep at night.

514. No. 32—Genitals. Soreness and scalding of the genitals are usually the result of unsuitable dietary or wet diapers. The mother should be careful to avoid this irritation by frequently changing the diapers, avoiding all washing, and always oil the irritated parts freely. Infants, suffering in this way, are not necessarily badly fed nor are they always suffering from want of care; but there is more of some food given them than there is ability to digest perfectly. Most commonly, this can be traced to the amount of sugar in the dietary; but, in many, it is due to the excessive amount of food. It is very difficult to prevent some fleshy infants from scalding when moisture from perspiration or any other cause is allowed to continue on the surface. These causes of irritation must not be confused with errors of diet.

515. No. 33—Abdomen. Some people are foolish enough to boast of the wonderful strength and health of

their infants simply because they have large abdomens. Perhaps there could be no greater error made than to estimate strength and endurance by the size and proportions of the abdomen. This idea may be correct as long as the largeness thereof is not greater than the symmetry of the infant allows; but, when the abdomen of an infant projects beyond the ribs, either in front or on either side, the infant should be considered a weaker or more delicate one and to have suffered from unsuitable dietary just in proportion as the abdomen has been distended beyond these outlines. The distention, in these cases, is always due to foul gases thrown out by decomposing food in the intestinal tract. When this is continued for months, the muscular coats of the intestines have lost their strength and stretch very easily, thus causing this ungainly shape. Infants who have suffered in this way many months require the most careful feeding to remove this deformity and repair the damages caused by improper feeding. The physician should always decide the cause of this deformity, for, in some infants, it is due to diseased organs or parts in the abdomen.

516. No. 34—Skin. In the healthy, well-nourished infant, the skin is usually smooth and free from eruptions; but where the diet has been persistently wrong, it is a very common thing to find children showing eczematous eruptions on the skin, particularly upon the cheeks and forehead. In many cases, these eruptions will appear upon other parts of the body also, especially upon the back of infants who sleep in very warm beds, and around the hips where thick diapers are worn. Some children inherit a disposition to skin eruptions, but the great majority of these diseases in infants under a year old are due to errors in the dietary. As long as these children continue to be overfed and have foul, un-



healthy stools, there is no possibility of having these eruptions removed. Generally, good diet will remove them in a few weeks, and as they grow older and use a more diversified food, these skin eruptions gradually pass away. If they do not quickly subside, the physician should be consulted, as some of them are not traceable to the diet alone.

517. No. 35—The Head. The opening, or fontanelle, in the head of the young infant remains open to some extent until the child is fifteen to eighteen months old. In infants improperly fed, it will remain open very much longer. Such an infant is also slow in teething. Slow development of bone is generally considered an evidence of deficient mineral constituents in the dietary and always demands a change of food. Infants who are kept entirely on a milk diet, either human or cows, longer than six or eight months, are very likely to show this deficiency; but, just in proportion as starchy food is added to the milk and properly digested, so will the growth of bone be increased.

518. Many mothers make the serious mistake of thinking that no food can be as good for an infant as a continued milk dietary. They may, in this way, grow babies large and fat, but very pale and deficient in energy. It is generally found, in these infants, that the deficiency in the growth of bone also means softness of bone, and this allows the head to become enlarged and ill-shaped. These infants show very little resistance to sickness and the mortality among them is very high when attacked by the ordinary ailments of infancy. They are very liable to develop convulsions and head affections as a result of slight sickness. In their ordinary health they are prone to deformities such as crooked spines, bow-legs or knock-knees.

519. No. 36—Veins. The appearance of large blue



veins upon the head and temples of a pale child shows an undue determination of blood to the brain. These infants generally pass into a very nervous condition with a strong liability to convulsions or inflammation of the brain from slight cause. The bony structures are generally soft and deficient in growth and the inordinate circulation of the blood in the head, by pressure on the bones, thus enlarges the head and frequently changes the shape also. This condition is often the result of poor nutrition, and these infants are always so near the inflammatory point that it requires very little stimulation, through some dietetic error, to produce a genuine head affection. Children in some families inherit the disposition to grow this way. Unsuitable dietary and continual living in warm rooms tend to produce this result in others. This disposition in an infant requires the utmost care in the diet, the best hygienic surroundings and long-continued watchfulness to avoid bad results. They should live in the open outside air as much as possible.

520. No. 37—Flesh. There is, perhaps, no better test of the perfect nutrition of an infant than the hard, firm condition of the flesh. Just in proportion as the nutrition is poor and deficient, so will the flesh be soft and flabby. The flesh of the well-fed infant becomes hard, firm and elastic, and when pinched up between finger and thumb, gives a resistance always guaranteeing success. The skin of these infants is always mottled and pink, an unmistakable evidence of the best infantile nutrition.

521. No. 38—Bones. Under item No. 35, we have spoken of the effect upon the teeth and bones of the head produced by an imperfect dietary. As children grow older, the long bones will also give evidences of unsuitable food. This is seen in rickety children when the muscles become

stronger and they make some effort to use their limbs. Curvature of these long bones results from a diet which gives an insufficient firmness and strength to the bone. The result is that, when these infants commence to walk, they are likely to become bow-legged or knock-kneed. The ribs also become flattened on the sides, pressing the breast-bone outward or forward, giving the infant that chicken-breast appearance, characteristic of a rickety child. Other bone deformities also appear (15), but those mentioned above are the most conspicuous.

#### DIRECTIONS FOR USING THE FEEDING CHART

##### *Amounts of food*

522. 2—Cream (fat). First week: Two to eight teaspoonfuls of lightest cream daily. Next three weeks: Two to four ounces daily. One to nine months: Two to six ounces daily if well digested (240).

523. 3—Human milk. It is required only during the first few weeks in healthy, well-developed children, but longer for infants who have been damaged by unsuitable nursing or substitute feeding. Five to eight ounces daily, added to the other food, are generally enough to increase the digestion and give marked improvement in the infant (198).

524. 4—Skim-milk (proteids). First week: None. Next three weeks: Very little, or one-half to one ounce daily. One to twelve months: Two to twenty-five ounces daily (241).

525. 5—Whey (liquid proteids). It is used only when enough skim-milk can not be digested. Large amounts thereof may require reduction of the sugar. It is about

one-third the strength of skim-milk and may be used proportionately (395).

526. 6—Lime-water. First week: One-half to one ounce daily. Next three weeks: One to two ounces daily. After the first month: One to two ounces daily and more in hot weather. Add to the meals just before feeding (401).

527. 7—Water (boiled or filtered). First week: Eight to twelve ounces daily. Next three weeks: Twelve to seventeen ounces daily. One to two months: Eighteen to twenty-one ounces daily. After two months: Gradually reduced as milk increases.

Shortage in amount of water gives dissatisfaction after feeding. Overfeeding causes spitting or vomiting of water and continual urinating.

528. 8—Milk-sugar. First week: One ounce to sixteen ounces of food mixture. Next three weeks: One ounce to fourteen ounces of food mixture. After first month: One ounce to eighteen or twenty ounces of food mixture. It must always be reduced as additions of starch show irritation of the rectum (306).

Cane-sugar. When this is used instead of milk-sugar, only half the above amounts can be given (408). Both sugars may be combined in some cases with great benefit (236).

529. 9—Starch. Only small amounts are added before third month (303). That kind should always be used which is most easily digested whether it is malted, baked or boiled. The amounts are shown in the feeding schedule (573-579).

530. 10—Unused food. There should always be made at least one meal more than is fed each day. This provides for accidents to bottles. The amount of unused food should be recorded regularly, to detect errors in the size and number of meals (416).

531. 11—Beef tea, beef juice and albumen. These foods are allowable only when milk can not be digested. Beef tea and albumen are seldom used for infants under six or eight months old and are very poor substitutes for the milk diet. In older children, they are valuable when used with a starchy diet (417).

532. 12—Feed, how often. Every one to three hours within five minutes after the child shows hunger (419-425), if the stools are formed.

533. 13—Day meals. These should be given regularly whether awake or asleep. Two alternating sizes should always be used, varying in size from one-half to three-fourths of an ounce to show which is digested most comfortably (429). The number fed daily must not vary (454) unless when reduced as the infant becomes older. Food can be increased by strengthening it or increasing the size of the meals.

534. 14—Night meals. These should be one-half to one ounce larger than the largest day meal and only fed when the infant awakens. They always become fewer with increasing age. In well-fed infants, four to six months old, there may be none from 7 or 8 P. M. till 6 A. M. The largest meals are always needed after and before the long night sleeps. Young infants (under six months) have the most perfect digestion during the night (437).

535. 15—Whole day's food. This records the amount fed each twenty-four hours. Well-fed infants seldom show a variation of more than one-half ounce from day to day. Great variations always mean failure except when made in sickness or to correct errors. This item must *always be recorded* (443).

536. 16—Spits. This refers to the one-fourth or one-

half teaspoonful often raised by gas or hiccough. It indicates a full stomach and warns against increasing the size of meals (447).

537. Vomits. This shows too large meals or too much fat or sugar in the meals. When only water appears, the food is too dilute (450).

538. 17—Number of meals daily. These should always be uniform. Irregularity in number prevents success (454) except when hunger or poor digestion demands a variable number of meals at times (228-230).

539. 18—Medicine. This is only a record for future use or guidance. Usually, only digestive preparations are recorded (151).

540. 19—Stools, their number. One or two daily are evidence of success. Greater numbers generally show imperfect digestion of food except during the first month (459).

541. 20—Color. An even color shows perfect, and mixed shows faulty digestion; color also shows the kinds of food used. Milk stools should be always yellow. Starch gives a dark color (460-463).

542. 21—Odor. Natural shows perfect digestion. Foul or strong odors prove fermentation or decomposition (465).

543. 22—Kind. Splashy is due to fermentation, mostly of sugar or starch (466). Soft shows imperfect digestion (467). Formed shows perfect digestion (468).

544. 23—Colic. Usually shows unsuitable feeding either in quantity or quality (470).

545. 24—Weight. Should be recorded daily for perfect work. Increases of more than one ounce each day in hand-fed infants soon result in indigestion and diarrhea (479).

546. 25—Gas. Extra gas is proof of overfeeding either

in the size of the meals or in some of the foods contained therein (491).

547. 26—Gas (up or down). Coming up shows indigestion in the stomach, and going down shows it in the bowels (491).

548. 27—Sleep. A properly fed infant sleeps well. A hungry or overfed one always sleeps poorly (497).

549. 28—Temper. This is disturbed in the same way as the sleep (499).

550. 29—Hungry before meals. Should be only five minutes. Fifteen to twenty minutes means no growth. Thirty to forty minutes means loss of weight (654).

551. 30—Temperature. Fever demands a reduction of the food (506).

552. 31—Urine. Changes in this often indicate approaching sickness or show errors in the food (513).

553. The remaining seven items are intended mostly for the physician's use and do not require daily attention. All the previous items are a daily guide and educator for the mother till she becomes expert in detecting errors. After she becomes familiar with this work, she can use a very simple chart devised by one of my patients (555). It is a record of the food, weight and number of stools, enabling any mother, well educated in this work, to see quickly what progress is made from day to day and also the exact diet used.

554. Where errors are made and sickness is the result, both charts show where correct work was done, and a return to the diet at that point generally corrects the disturbance.

555.

## THE RECORD CHART

April. ....	4	5	6	7	8	9
Cream. ....						
Skim-milk. ....	11 oz.	11 oz.	11 oz.	11 oz.	11 oz.	11 oz.
Water. ....	7 oz.	7 oz.	7 oz.	7 oz.	7 oz.	7 oz.
Granulated sugar, teaspoons. ....	2	2	2	2	2	2
Imperial granum, teaspoons. ....	4	4	4	4	4	4
Durkie's rice flour, teaspoons. ....	2	2½	2½	2½	2½	2½
Malt extract, teas.	4	4	4	2	2	2
Stools. ....	2	1	1	2	1	1
Weight. ....	12-14¾	13-0¼	13-2	13-3	13-4½	13-7
Unused food. ....	0	0	0	0	0	0

The above chart is an exact copy from daily work of a very intelligent and experienced mother who was unable to nurse this infant or an older brother successfully. It will be noted that skim-milk, a baked starch (Imperial Granum) and a boiled rice flour were used together. The Malt Extract was added to overcome the constipation. Mellin's Food in one or two teaspoonfuls, daily amounts, will often do this also. Such increases in weight as are shown above always guarantee the future success of the infant mentally and physically.

556. This chart illustrates what features may or should be retained by a mother who has filled the educating chart for several weeks until she has become familiar with all the features necessary in feeding an infant successfully. The main object of this record chart is to keep a full but short account each day of the exact amount of all foods given, the number of stools and the changes in weight.

557. If an error occurs at any time and sickness follows, a reference to this chart shows where the feeding was correctly done and where the error commenced. This enables the nurse or mother to return to the last formula which gives correct results. In this way, errors are corrected at once and sickness soon relieved. No woman should attempt to feed an infant without keeping an exact record daily of all foods given and the effects thereof.



## CHAPTER VIII

### FOOD SCHEDULES

#### MILK IN THE SCHEDULES

558. In preparing milk for these schedules, certified milk from Towars Wayne County Creamery was used. It was mostly Jersey and Holstein mixed, cooled as soon as drawn from the cows, then bottled and kept surrounded with ice continuously until delivered to the customers. It varied in age from sixteen to twenty-four hours, and in winter, may have been thirty-six hours old before being used. The cream measured about six ounces on the top of each quart and was carefully removed from the milk by pouring it off, thus leaving the cream and skim-milk separate and ready for use; newer milk is desirable but difficult to obtain in cities.

559. When milk cannot be obtained in this way, it should be put into a fruit jar or milk bottle as soon as drawn and packed in ice until the cream separates. This occurs more rapidly with milk from some cows than from others, and also occurs in proportion to the amount of ice with which the milk is surrounded. The colder the milk is kept, the more quickly will the cream and milk separate. Usually, with an abundance of ice, cream will separate in two or three hours. When less ice is used, the time will extend to four or five hours (119). When milk stands only in a cold room or cellar, it will require from twelve to twenty-four hours or more, according to the temperature of the place in which it stands. Animal heat should always be

driven out of milk as quickly as possible after it is drawn, by the use of cold water when ice cannot be obtained. Milk should always be bottled to exclude air and allow the surrounding cold to reduce the temperature as rapidly as possible (122).

560. As milk is usually laxative in proportion to the amount of cream which it contains, a mother can, in a few days, ascertain the number of hours which she must leave it standing in cold surroundings before preparing the baby's food. This will depend upon her facilities for cooling it. In proportion as she removes the cream, so will the remaining skim-milk become more constipating. If she finds that the skim-milk left, after removing all the cream which rises in two hours, is still loosening to the bowels of the infant, she can allow the milk to stand an additional hour or two in order to remove enough cream so that the remaining milk, when diluted with water and properly sweetened, gives the requisite one or two soft formed stools necessary each day for the infant's proper growth and development (390). When any difficulty is experienced in making the infant happy or securing formed stools, the food should always be thoroughly pasteurized after it is prepared for use (145).

561. Mothers in different localities, with different facilities and different breeds of cows, can very quickly prepare fresh food for infants who can digest one ounce of cream with every four to five ounces of milk, by using new milk and sugar-water. When any of the schedules Nos. 1 to 7 are used, they can adjust the skim-milk to the necessities of their infants by removing a greater or lesser amount of cream from it, as in 560. This plan will supply a fresh milk and give the same or better results than those obtained by

people in cities and towns who receive an older bottle-milk with the cream entirely separated, and then require to bring the cream and skim-milk together again in the proportions needed for successful feeding.

562. Top-milk is the name given to eight ounces or more of cream and milk taken from the top of the bottle after the cream has entirely risen. This usually requires eight ounces for young infants from two to three months old, but is enlarged to twelve and sixteen ounces as they grow older. This top-milk is suited to some infants when properly diluted with sugar-water. An increased amount of milk is always taken with the cream when greasy, fatty stools show fat decomposition instead of perfect digestion.

563. The simplest method and the one by which the fewest mistakes are made and which meets all types of digestive powers is to separate the cream and milk entirely and then bring them together in a proportion suitable to the digestive power of any infant (118-120). This is the plan which the author has found most satisfactory and successful and the one followed in all the following schedules (573-579).

564. In warm weather, when ice is not obtainable, fresh milk should be kept in a well, cellar or any cold place until the cream has been removed and the milk prepared for feeding (560). This method will give a fresh food free from souring, and if the food is bottled, pasteurized at once and kept cold, it will remain sweet until fed (122).

565. All milk should be pasteurized during warm weather after the cream is removed. This should be done to kill the souring bacteria which accumulate so rapidly in summer and thus spoil all milk foods (145).

566. The amount of cream on a quart of milk varies from four ounces on the poorest grades to six and one-half on the richest Jersey milk. This allows one ounce of cream to every seven of skim-milk in poorer grades and one ounce to every four and one-half in the richest grades.

567. As it is always necessary to feed milk as new and fresh as possible, it is best, when new milk can be obtained, to try feeding it diluted and sweetened according to the feeding schedules without waiting to separate the cream. This is especially necessary when the infant's digestive power is weak, and also in country places when an abundance of ice cannot be obtained to preserve the milk (204).

568. This plan will seldom be successful in infants during their first month, when they usually thrive best on a diluted cream only as in 610; but, after that age, it is well to try feeding with milk diluted two, three or four times and sweetened by adding one ounce of milk-sugar to every eighteen or twenty ounces of milk and water combined, or one ounce of granulated sugar to every thirty-five or forty ounces of the food mixture.

569. If the proportion of cream is too high, the stools will be fatty, greasy, rancid and foul odored. If there is not enough cream to suit the infant, the stools will be dry and constipated. The latter condition requires more cream (243).

570. When making a trial in this way, great care must be taken to give only small meals and always repeat them when the infant shows hunger, whether that be in one hour or two. This applies only to infants with soft but healthy stools. For success, the hungry infant *with healthy stools* must never be kept waiting more than five or ten minutes for its food (501).

571. Experience shows that the majority of infants cannot digest the natural proportion of cream in rich Jersey milk, and some require a large amount of it removed before they can be happy in daytime and rest well at night (115).

572. This great diversity in the feeding power of healthy infants is due mainly to the imperfectly developed condition of their digestive glands. In infants who have been wrongly fed, these glands are frequently injured by the fermenting or decomposing food resulting from too large meals or unsuitable proportions of foods in the meals. Infants of this class must always be fed very small meals frequently repeated (230).

The following schedules were selected from over 15,000 daily records of the amounts of foods given to infants each day. Their dietetic effects and advances in weight are shown in each case. All of these records were filled by the mothers or nurses and show great attention to details. They fairly represent the different types from small and weak but healthy infants to the large, vigorous ones, and illustrate very well what intelligent and industrious mothers can do with all sized healthy infants when they understand how to change or increase foods daily, according to the way they are digested. Only one of these mothers had any experience in doing this work before. By filling the charts, they quickly saw what were evidences of imperfect digestion and commenced at once learning to correct them. In a few weeks, they could generally tell clearly from the stools what advances and changes in foods were demanded to secure present and future success.

As all of these charts were filled by the mothers, they

show all the changes in diet which they thought necessary. Some of these were mistakes, but were always corrected when false stools showed the errors. In no case was more than a small mistake made and each one was a lesson to the mother and strengthened her for future work. Very little assistance was needed by any of them and some did the whole work alone after the first few interviews. Education of this kind is what benefits posterity, as it spreads the true principles of human nutrition among the human family.

Perhaps the most important facts which mothers have proven by the filling of these many thousand daily records of foods and their effects, are the proportions of cream, skim-milk, sugar and starch which are necessary to nourish each pound of an infant daily at different ages. While this must necessarily vary somewhat, the errors made by the mothers and shown in these schedules, together with the corrections, demonstrate clearly what amounts can be used with safety and success, and also the amounts which always prove to be a sure cause of indigestion with resulting diarrhea, sickness and loss of weight.

573.

## SCHEDULE No. 1

Age, days.	Cream, oz. tea.		Skim- milk, oz. tea.		Boiling Water oz. tea.		Lime- water, oz. tea.		Starch- water, oz. tea.		Milk- sugar, oz.		Cane- sugar, oz. tea.		Total Amount oz. tea.		Weight, lbs. oz.	
16	1	1	3	3	13	2	1				1				19		5	9
22	1	2	3	3	14	1	1				1				20		6	10
30	1	3	4	3	15	3	1				1				22		6	11
40	1	2	4	3	15	1	1				1½				22		6	15½
47	1	3	5	4	17	4	1				1⅔	0	2		25	5	7	4
55	1	3	6	4	17	4	1				1⅔	0	3		26	5	7	13
63	2	2	7	5	18	4	1	1			2	0	4		30		8	2
69	1		7	4	18	5	1				2	0	3		28	3	8	7
78	1		8		18	3	1				2	0	3		28	3	8	10¾
85	1	1	8	2	18		2				2	0	4		29	3	8	13

## SCHEDULE No. 1—Continued

Age, days.	Cream, oz. tea.		Skim- milk, oz. tea.		Boiling Water oz. tea.		Lime- water, oz. tea.		Starch- water, oz. tea.		Milk- sugar, oz.		Cane- sugar, oz. tea.		Total Amount oz. tea.		Weight, lbs. oz.	
92	1	3	8	5	17	1	2	3			2		0	4	30		8	15 $\frac{3}{4}$
98	1	4	10	1	18	4	2	3			2		0	4	33		9	9
108	1	5	11		19	2	2	5			2 $\frac{3}{4}$		0	4	35		10	2
115	2		10	4	19	4	2	3			2 $\frac{1}{3}$		0	4	34	5	10	8 $\frac{1}{4}$
123	2		11	4	20	5	2	5			2 $\frac{3}{4}$		0	5	37	2	10	11 $\frac{1}{2}$
131	2	1	12	2	21	1	2	5	Made of rice and oat flakes		3		1		38	3	11	3 $\frac{3}{4}$
138	2	2	13	3	22	1	3				3		1		41		11	12 $\frac{1}{2}$
145	2	3	14	2	23		3				3		1		42	5	12	3 $\frac{1}{4}$
153	2	2	14		24	4	3			0	2	3 $\frac{1}{2}$	0	5	44		12	11
161	2	2	14	2	24	2	2	4		0	5	3 $\frac{1}{2}$	0	5	44		13	5 $\frac{3}{4}$
168	2	2	14	1	24	3	2	4			3 $\frac{1}{3}$		0	5	44	3	14	
176	2	2	14	3	24		2	4	1		3		0	5	44	3	14	7 $\frac{1}{2}$
183	2	2	14	5	24	3	2	4	1		3		0	5	45	2	15	
190	2	1	13		20	5	2	2	1		2 $\frac{2}{3}$		0	4	39	2	15	4
199	2	2	13	5	21	4	2	4	1		3		0	4	41	3	15	
205	1	4	13	5	22	2	2	4	1		1		0	4	41	3	15	7 $\frac{1}{2}$
210	1	4	10	5	23	3	2	2	1		1		0	2	39	3	15	10

Average amount of food given daily for each pound of the baby's weight.

Age.....	16 days	1 $\frac{1}{2}$ months	2 $\frac{1}{2}$ months	3 $\frac{1}{2}$ months	4 $\frac{1}{2}$ months	5 $\frac{1}{2}$ months	6 $\frac{1}{2}$ months
Weight, lbs.	5 $\frac{1}{2}$	7 $\frac{1}{4}$	8 $\frac{5}{8}$	10	11 $\frac{3}{4}$	14	15 $\frac{1}{4}$
Cream, tea..	1	1 $\frac{1}{4}$	$\frac{3}{4}$	1 $\frac{1}{4}$	$\frac{3}{4}$	1	$\frac{3}{4}$
Skim-milk, teaspoons	4	4 $\frac{3}{4}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	7	6	5 $\frac{1}{4}$
Total.....	5	6	6 $\frac{1}{4}$	7 $\frac{3}{4}$	7 $\frac{3}{4}$	7	6

Milk-sugar varied from one-fourteenth to one-eighteenth of the foods and water combined. Cane-sugar was added as it was well digested, improved the weight and also gave a pretty pink color.

The slight irregularities in the increases of cream and skim-milk were due to overfeeding of them. This caused fermenting gas in the bowels with foul odors and softness of the stools. This must show at times when crowding any food in excess of the digestive power of the fluids secreted at each meal. Sugar and milk were replaced by condensed



milk preparatory to taking the long journey in the cars when moving to California.

During the last month, while changing food, the gain in weight was twenty-one ounces. It is always necessary to feed lightly when changing food in order to avoid adding more than the digestive power of the fluids secreted to convert it into healthy aliment.

In any infant whose progress for six months has been like that in schedules 1 or 2, the same relative increases in cream and skim-milk after that age can usually be maintained. With the substitution of suitable starch for the sugar and decided increases of starches after nine or ten months, partly bread and crackers from the hand, there can be no doubt of successful growth and development.

The milk fed was mostly Jersey and carried a large amount of cream which did not always rise completely to the surface of the milk even when perfectly iced all the time. It was predigested a large part of the first three months for both of these infants in schedules 1 and 2.

#### FACTS TO BE NOTED

The reduction in cream at two and one-half months was due to frequent three or four greasy stools each day.

The combination of cane and milk-sugar gave better results than one sugar alone. This boy and his twin sister, whose progress is shown in schedule No. 2, were striking examples of this. Their pink cheeks, hard flesh, bright sparkling eyes and red elastic skin showed the good results of a perfectly digested diet carrying a high proportion of sugar. It will be noted that they were very small infants when born. In addition to their small sizes, they were starved for sixteen days after birth while nursing their



mother, who was suffering from a puerperal fever and had very little milk, which was also a very poor quality as it gave colic and green mucous stools all the time.

Sugar was reduced at five and one-half months, when starch was added to the dietary.

Skim-milk increased steadily all the time.

Water and lime-water were three times greater than the milk and cream at sixteen days and less than one and one-half times greater at six and one-half months.

The increases of foods for the day's dietary in six months were:

Cream: One to two ounces, averaging one teaspoonful every twenty-five days.

Skim-milk: Three and one-half to thirteen ounces, averaging about one teaspoonful every two and one-half days.

Water: Twelve ounces to twenty-two ounces.

Lime-water: One to two ounces.

Milk-sugar: One and one-fourth to three and one-fourth ounces, averaging one teaspoonful every fifteen days.

Cane-sugar: One-third to one ounce.

The increase in weight of the infant was one hundred and fifty-four ounces in one hundred and eighty days, or only three ounces less than he would have made if he had nursed his mother successfully from birth.

574.

## SCHEDULE No. 2

Age, days.	Cream,		Skim- milk,		Boiling Water		Lime- water,		Starch- water,		Milk- sugar,		Cane- sugar,		Total Amount		Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	lbs.	oz.
16	0	3	1	4	8	5	0	3			$\frac{1}{2}$				11	3	4	6
24	0	3	2		13		0	3			$\frac{1}{2}$				16		4	3
32	0	2	3		13	5	0	4			1				17	5	3	14
38	0	2	3		13		0	4			1				17		4	$3\frac{1}{2}$
46	0	3	3	5	17	1	1				$1\frac{1}{3}$	$\frac{1}{3}$			22	3	4	$7\frac{1}{2}$
52	0	2	3	3	14	1	0	4			1	$\frac{1}{2}$			18	4	4	$12\frac{1}{2}$
58	0	3	4	4	18	2	1				$1\frac{1}{3}$	$\frac{1}{2}$			24	3	5	$1\frac{1}{2}$
65	0	3	4	3	17		1				$1\frac{1}{2}$	$\frac{1}{2}$			23		5	3
71	0	4	5	4	17	4	1				$1\frac{1}{3}$	$\frac{1}{2}$			25		5	$6\frac{1}{4}$
77	0	4	5	2	19	2	1				$1\frac{1}{3}$	$\frac{1}{2}$			26	2	5	$9\frac{1}{4}$
85	0	4	6		20		2				$1\frac{2}{3}$	$\frac{1}{2}$			28	4	5	$12\frac{1}{2}$
93	0	5	7	1	22		2	3			2	$\frac{2}{3}$			32	3	5	$15\frac{1}{2}$
100	1		7	2	21	3	2	3			2	$\frac{2}{3}$			32	2	6	$9\frac{1}{2}$
107	1		7	3	21	5	2	3			2	$\frac{2}{3}$			32	5	6	11
114	1		8	2	21	4	2	3			2	$\frac{2}{3}$			33	3	7	2
121	1	2	8	3	20	3	2	3			2	$\frac{2}{3}$			32	5	7	5
130	1	2	9	3	21	3	2	4			2	$\frac{2}{3}$			35		7	13
138	1	2	9	4	20	4	2	4			2	$\frac{2}{3}$			34	2	8	4
145	1	3	11	5	24	3	3				2	$\frac{2}{3}$			40	5	8	$11\frac{1}{2}$
152	1	2	10	5	22	3	2	4	Rice and oat flakes		2	$\frac{1}{2}$			37	2	9	$1\frac{1}{2}$
160	1	3	11	5	23	1	2	5			$2\frac{1}{2}$	$\frac{1}{2}$			39	2	9	$8\frac{3}{4}$
167	1	4	11	4	22	1	2	4		0 1	$2\frac{1}{2}$	$\frac{1}{2}$			38	2	9	15
174	1	5	12	2	23	1	2	5		0 2	$2\frac{2}{3}$	$\frac{1}{2}$			40	3	10	$2\frac{1}{2}$
181	1	5	12	5	23	2	2	5		0 3	$1\frac{1}{2}$	$\frac{1}{2}$			41	2	10	5
185	1	5	13		23	1	2	5		0 3	$1\frac{1}{2}$	$\frac{1}{2}$			41	2	10	$10\frac{3}{4}$
196	1	4	11	5	21	3	2	3		0 2	$1\frac{1}{3}$	$\frac{1}{2}$			37	5	10	$3\frac{1}{4}$
203	1	5	11	5	21	4	2	2		0 2	$1\frac{1}{3}$	$\frac{1}{2}$			38		10	10
209	1	4	12		21	1	3	2		0 4	$1\frac{1}{3}$	$\frac{1}{2}$			39		11	

Average amount of foods given daily for each pound of the infant's weight:

Age.....	16 days	$1\frac{1}{2}$ months	$2\frac{1}{2}$ months	$3\frac{1}{2}$ months	$4\frac{1}{2}$ months	$5\frac{1}{2}$ months	$6\frac{1}{2}$ months
Weight, lbs.	$4\frac{3}{8}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{3}{4}$	$8\frac{1}{4}$	$9\frac{3}{4}$	$10\frac{1}{4}$
Cream, teas.	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{2}{3}$	1	1
Skim-milk, teaspoons	$2\frac{1}{4}$	$5\frac{1}{3}$	6	$6\frac{1}{2}$	7	7	7
Total .....	3	6	$6\frac{1}{2}$	$7\frac{1}{6}$	$7\frac{2}{3}$	8	8

The milk used was mostly Jersey and the measures used were spoons.

This infant was very feeble when born and its growth seriously retarded by nursing the sick mother during the first sixteen days. The hands were cold and blue up to the elbows and the feet and legs cold and blue up to the knees when first seen by the writer at sixteen days old. She was not expected to live and made little progress for a month.

Her power to digest cream was weak. It loosened her bowels and had to be fed in very small quantities.

As sugars caused a scalding redness around the bowels when starch was added to the dietary in the sixth month, they were reduced at once to avoid causing indigestion and diarrhea.

Water was reduced to strengthen the food, to stop vomiting of water and also to allow the additions of starch-water.

After excluding the first month, when it was difficult to keep this child alive, we find the following increases in the daily dietary in five months:

Cream: Three teaspoons to one ounce, and three teaspoons, or one and one-fifth teaspoons monthly.

Skim-milk: Three ounces four and one-half teaspoons to eleven ounces and three teaspoons, or one teaspoonful in about three and one-third days.

Milk-sugar: One ounce to two and one-half ounces, or one and one-half ounces in five months.

Cane-sugar: One and one-half to three teaspoons, or one and one-half teaspoons in five months.

The increase in weight was ninety-three ounces in 152 days. When we consider the small size of this baby, her difficulty in living during the first six weeks and the damage done to her while nursing her mother, this increase in weight is very satisfactory. It shows an average gain

of five ounces weekly, which is large for an infant so small and more than seven ounces weekly would be for an infant commencing life at seven and one-half pounds, the average weight at birth.

The sugar and milk were reduced at the sixth month, as in schedule No. 2, gradually substituting condensed milk to secure safety and ready diet while traveling.

These schedules, No. 1 and 2, are not continued farther, as the parents moved to California when the infants were six and one-half months old.

These two schedules show the different proportions of food needed, and the different progress made by two infants on the same diet, managed by a most intelligent and industrious mother under the same conditions in every way. Their care and attention could not have been better.

It was impossible to make these infants happy and sleep well until the milk was peptonized. From the time this was done, they were entirely happy and their progress was perfectly satisfactory.

575.

## SCHEDULE No. 3

Age, days	Cream,		Skim- milk,		Boiling water,		Lime- water,		Starch,	Milk- sugar,	Human milk,		Total Amount	Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	oz.	oz.	tea.	oz.	lbs.	oz.
8	1	3	1	3	18	3	1	3		1½			23	10	1
15	1	2	1		17	3	2	4		1			22	3	9 10½
22	1	1	0		11	4	3	5		1	5	5	22	3	9 9
27	1	4	0	1	12	5	4			1	7	2	26		9 13
35	1	5	2	3	14	3	4			1½	7	4	30	3	10 5½
43	2		5		14	5	4	1		1¾	8	3	34	3	10 9
48	2		5		14	1	3	5		1½	7		32		11
54	2	3	5	4	14	5	4	1		1¾	5	2	32	3	11 6½
62	2	4	7		15	3	4	2		1¾	5	3	35		11 9
69	2	5	7	4	15	3	4	4		1¾	5	5	36	3	11 15
76	3	3	13		13	4	3	3		1½	5	2	39		12 7
84	3	2	13		13	4	3	2		1½	5	1	38	3	12 13
92	1	2	15	2	15	1	3	5		1¾	4	2	43		13 3½
98	4	3	17	5	16	1	3	4		1¾	3	2	45	3	13 10½

## SCHEDULE No. 3—Continued

Age, days	Cream,		Skim- milk,		Boiling water,		Lime- water,		Starch,		Milk- sugar,		Human milk,		Total Amount		Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.		oz.	tea.	oz.	tea.	lbs.	oz.
105	5		19	4	16	2	3	4	Starch, rice and oat flakes		2		2		47	0	14	4
112	5	4	21	3	16	1	3	3			2		1		47	5	15	
119	0	4	4		3	1	0	1		$\frac{1}{3}$		0		8		15	5	
126	1	4	12	5	20	5	2	3	1	1	$1\frac{1}{4}$		0		39		14	$8\frac{1}{2}$
131	2	4	16	4	19	1	2	4	1	5	$1\frac{1}{3}$		0		43		15	2
138	2	4	17	4	20		2	4	2	3	$1\frac{1}{3}$		0		45	3	15	5
148	2	4	18		19	1	2	4	3		$1\frac{1}{3}$		0		45	3	16	2
155	2	2	16	1	17	5	2	2	2	2	$1\frac{1}{4}$		0		41		16	7
163	2	4	18		19	3	2	4	2	4	$1\frac{1}{4}$		0		45	3	17	
168	2	4	18	2	19		2	4	2	5	$1\frac{1}{4}$		0		45	3	17	5
175	2	4	18	3	18	4	2	4	3		$1\frac{1}{4}$		0		45	3	17	11
183	2	4	19		19		2	4	3		$1\frac{1}{4}$		0		46	2	17	13
192	2	4	19	3	19	1	2	4	3		$1\frac{1}{4}$		0		47		18	6
199	2	4	19	5	19	1	2	4	3	1	$1\frac{1}{4}$		0		47	3	19	
206	2	4	19	5	19		2	4	3	2	$1\frac{1}{4}$		0		47	3	19	$8\frac{1}{2}$
213	2	4	19	5	19	2	2	4	3		$1\frac{1}{4}$		0		47	3	20	
219	2	4	19	5	19	2	2	4	3		$1\frac{1}{4}$		0		47	3	20	6
224	2	4	19	5	19	2	2	4	3		$1\frac{1}{4}$		0		47	3	20	$13\frac{1}{2}$
231	2	4	19	5	19	2	2	4	3		$1\frac{1}{4}$		0		47	3	21	$4\frac{1}{2}$
237	2	4	19	5	19	2	2	4	3		$1\frac{1}{4}$		0		47	3	21	8
242	2	4	19	5	19	2	2	4	3		$1\frac{1}{4}$		0		47	3	21	12
249	0		22	4	19	1	2	4	3		$1\frac{1}{4}$		0		47	3	22	2
255	0		5	4	4	5	0	4	0	5	$\frac{1}{3}$		0		12		21	$11\frac{1}{2}$
262	0		22		18	3	2	3	3		$1\frac{1}{4}$		0		46		21	6
268	0		22	5	19	3	2	4	3		$1\frac{1}{3}$		0		48		21	15
276	0		23		19	2	2	4	3		$1\frac{1}{3}$		0		48		22	4
284	0		23		19	2	2	4	3		$1\frac{1}{3}$		0		48		22	14
286	0		23	4	18	2	2	4	3	2	$1\frac{1}{3}$				48		23	
294	0		23	4	18	2	2	4	3	2	$1\frac{1}{3}$				48			
301	0		24		18		2	4	3	2	$1\frac{1}{3}$				48			
308	0		24		18		2	4	3	2	$1\frac{1}{3}$				48		24	12
314	0		24		18		2	4	3	2	$1\frac{1}{3}$				48		25	

The milk used in this schedule was from Holstein cattle, tested with tuberculin and certified to be free from tuberculosis.

The above foods were measured with a graduate which is nearly one-fourth smaller than the usual spoon measure. This measure and the Holstein milk, which is weak in proteids, make the proportion of milk to weight show larger than it is in some other schedules.

Average amount of food given daily for each pound of the infant's weight:

Age.....	8 days	1½ months	2½ months	3½ months	4½ months	5½ months
Weight.....	10 lb. 1 oz.	10 lb. 9 oz.	12 lb. 7 oz.	14 lb. 4 oz.	15 lb. 5 oz.	17 lb. 5 oz.
Cream, teaspoons.	1	1	1¾	2	1	1
Skim-milk, teas. . .	1	3	6¼	8¼	7	6⅓
Human milk, teas.	0	5	2⅔	1	0	0
Total.....	2	9	10⅔	11¼	8	7⅓

Milk-sugar varied from one-sixteenth at eight days to one-twentieth at three and one-half months of the food and water combined. It then varied to one-seventeenth of the food mixture when starch was added to the dietary at five and one-half months.

The continuance of milk-sugar for such a long time was exceptional in this infant. Usually, it has to be removed entirely when starch is fed liberally; but, in this case, the starch was not fed as liberally as could have been done if the sugar had been stopped entirely. His mother was too well satisfied to change or leave out the sugar, and as she had experience with feeding two other children, she wished to leave "well enough" alone.

When 192 days old, the nurse was directed not to increase the food any more till the child ceased to gain in weight, as the strong odored stools indicated overfeeding. It will be noticed that from 192 to 242 days there was practically no increase of food, but there was an increase of fifty-four ounces in weight in those fifty days. This was too much at that age, and both mother and nurse were strongly cautioned against a too great size, a heavy sluggish baby or an acute indigestion if the food was increased

too rapidly again. This advice was observed and the result is a strong, active, vigorous child, perfectly developed both mentally and physically.

All cream was removed at 249 days on account of the greasy, foul stools. This allowed the skim-milk to be increased and the stools became healthy at once.

This infant is the third one in the family. The mother tried to nurse the first two but was compelled to wean them when they were but a few weeks old, as they had green, mucous stools continually, were very much disturbed and did not thrive. She nursed this infant only part of the second day and even this amount of her milk distressed him greatly.

He was fed every one and one-half hours in the beginning, as per schedule, but as he did not digest the food well, was colicky and lost weight, a few ounces of human milk were obtained and added to his food. The great value of this addition is shown after this by the steady increases in weight.

The great reduction in food when 119 and 255 days old was necessitated by attacks of tonsilitis with high fever. If the food had not been reduced, a violent attack of indigestion with dysentery would have been the result at 119 days, as even with the reduced diet, dysenteric stools appeared for one day.

The proportion of milk and cream at 112 days was too high for an infant fifteen pounds in weight and the attention of his nurse was drawn to the too rapid increases of these items. The truth of this was shown in the advances made in weight afterwards on a much smaller amount of cream and skim-milk, when a small proportion of starch-water was added to the dietary.

The figures for starch represent the amounts of the dry starch boiled each day. The water shows the amount of starch-water which this makes daily when they were boiled together. The additions and substitution of oat flakes for rice flakes in making starch-water at 148 days caused foul, mucous stools and had to be abandoned. Afterwards they were combined and boiled together in the proportion needed to produce soft, formed stools.

The proportions of milk and cream to the weight of the child were correct after 130 days, and with judicious increases in the proportion of starch, they were continued till the infant was ten or twelve months old, at which time no infant can safely use more than twenty-six ounces of milk and two to four ounces of cream daily. The starch foods were always steadily increased and became largely dry bread crumbs, crackers, crusts and all well-cooked cereals after the infant was eight months old.

576.

## SCHEDULE No. 4

Age, days	Cream,		Skim- milk,		Boiling water,		Lime- water,		Starch,		Milk- sugar,		Total Amount,		Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.		oz.	tea.	lb.	oz.
42	1		1	4	17	2	1				1		21		8	
50	2		5		16		1				1		24			
56	2		5		16		1				1		24			
63	2		5		16		1				1		24		8	4
67	2	1	5	4	18		1	1			1		27		8	8
74	2	3	6		20	0	1	3			1		30		8	12
83	3	4	8		19	4	1	4			1½		33		8	12
89	3	4	8	5	18	5	1	4			1½		33		8	12
95	3	5	10	1	20	2	1	4			1¾		36		9	8
101	3	5	11	3	19	3	1	4			1¾		36	3	9	8
109	3	2	12	2	19	4	1	4			1¾		37		10	
119	3	2	13	1	19	5	1	4			1¾		38		10	
125	3	4	15		19	3	1	5			2		40		10	8
131	3	2	14	4	16	2	1	4	Rice or oat flakes and Mellin's Food		1¾		36		11	
138	3	5	16	2	17	2	1	5			2		39	2	11	
145	4		18	3	19		2				2		43	3	11	4
152	4		19	1	18	2	2				2		43	3	11	8
159	3	4	17	2	16	4	1	5		0 2	2		39	5	12	



## SCHEDULE No. 4—Continued

Age, days.	Cream		Skim- milk,		Boiling water,		Lime- water,		Starch,		Milk- sugar,		Total Amount,		Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.		oz.	tea.	lb.	oz.
167	4		16	3	15		1	4	0	4	1 $\frac{1}{4}$		37	5	12	
173	4	2	17	1	14		1	4	0	5	1 $\frac{1}{4}$		38		12	12
177	4	5	17	2	12	5	1	4	1		1 $\frac{1}{3}$		37	4	13	
184	4	4	15	3	11	4	1	3	0	5	$\frac{3}{4}$		34	1	13	4
188	5	1	17	2	13	1	1	4	1		1		38	2	13	8
196	5	3	18		13	5	1	5	1	2	1		40	3	13	8
200	5	1	17		13		1	4	1	3	1		38	4	14	
206	5		17	1	12	2	1	4	1	3	1		37	4	14	4
212	5	1	17	2	12		1	4	1	4	1		37	5	14	8
218	5	1	17	2	12		1	4	1	4	1		37	5	14	12
224	5	1	17	2	11	5	1	4	1	4	1		37	4	14	12
230	5	1	17	2	12	1	1	4	1	5	1		38	1	15	
236	5	1	17	2	12	1	1	4	1	5	1		38	1	15	4

The above figures were obtained by measuring with a spoon, allowing two flat tablespoons or six flat teaspoons to each ounce. Spoon measure is usually one-eighth larger than correct graduate measure.

This infant was fed almost entirely on a sugar dietary during the first six weeks. This prevented any increase in weight and also made him very cross and restless. His buttocks and genitals were very much reddened and scalded by the frequent fermented sugary, splashy stools when first seen by the writer. He was a very healthy baby and soon recovered from the damage caused by this unsuitable dietary, but, of course, remained lighter in weight than he would have been if fed properly during the first six weeks, the time of most rapid growth.

The following analysis shows the amounts of the different foods consumed daily at different ages for every pound of the infant's weight:

Age.....	6 weeks	10 weeks	14 weeks	4½ months	5½ months	6½ months	7½ months	8 months
Weight. lbs..	8	8½	9½	11	12	13½	14¾	15¼
Cream, teas..	½	1½	2¾	2	2	2½	2	2
Skim-milk, teaspoons..	1½	4	7¼	9	8¼	8	7	6⅔
Total.....	2	5½	10	11	10¼	10½	9	8⅔

It will be noticed that after the addition of starch at five and one-half months, the skim-milk was reduced somewhat and remained nearly stationary afterwards and the cream was increased only enough to prevent some of the constipation caused by the starch. As soon as rice caused extreme constipation, farther additions and changes were made of other starches—oatmeal or Mellin's Food when constipated and rice only when the stools became too soft or watery. It will be noticed also that the amount of starch in his bottles never reached one teaspoonful daily for each pound the infant weighed.

When additions of starch caused extra gassy discharges from mouth or anus, they were reduced or kept stationary, and additions of skim-milk were continued within the correct general ratio of this food to the infant's weight. After this, starch was again added. In this way, the effect of each food on the stool was noted and confusion avoided. Continuous alternation of food in this way every six to ten days secured full growth and perfect development of body and brain.

If this child had been properly fed and made the usual growth of one ounce daily during the first six weeks, he would have weighed seventeen and one-half pounds at eight and one-half months—a full average for a healthy, well-developed child.

The milk in this schedule was Jersey and fed in its raw condition during cold weather. When he showed any indigestion, he was given pepsin before meals during the first few months. After eight months, bread and crackers were fed also in small amounts and he grew to be a strong, healthy, large child.

577

## SCHEDULE No. 5

Age, days	Cream,		Skim- milk,		Boiling water,		Lime- water,		Starch,		Milk- sugar,		Total Amount,		Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.		oz.	tea.	lbs.	oz.
56	0	2	3	1	5	4	0	5			$\frac{1}{2}$		10		8	8
61	0	5	6	2	11	2	1	3			1		20		9	4
67	1		10		13	3	2	1			$1\frac{1}{3}$		26	4	9	8
72	0	5	8	2	17	2	1	4			1		28	1	9	15
78	1	3	13	1	16	3	2	3			$1\frac{3}{4}$		33	4	10	4
84	1	3	13	3	15	5	2	4			$1\frac{3}{4}$		33	3	10	13
90	1	4	15	3	18		2	4			$1\frac{2}{3}$		37	5	11	2
96	2		16	2	18	3	2	4			$1\frac{1}{2}$		39	3	11	12
102	2	2	16	5	18	2	2	4			$1\frac{2}{3}$		40	1	12	
108	2	2	18	2	19		2	2			$1\frac{2}{3}$		42		12	2
114	2	3	19	2	18	1	2	2	Imperial Granum Mellin's Food Oat and rice water	$1\frac{2}{3}$		42	2	12	8	
120	2	3	17	5	16	5	2	2		$2\frac{1}{4}$		39	3	12	12	
126	2	3	17	4	16	4	2	1		$1\frac{1}{2}$		39		13	1	
132	3		19	2	17	4	2	2		$1\frac{2}{3}$		42	2	13	2	
138	1	4	10	2	15		1			$\frac{3}{4}$		28		13	14	
146	2		15	2	16	4	1	5		$1\frac{1}{3}$		37	1	14		
150	2	2	17	1	16	2	2			$1\frac{1}{3}$	2	40	1	14	6	
156	2	1	16	3	16	1	2			$1\frac{1}{2}$		39	5	14	8	
162	2	1	15	5	16	3	1	5	$1\frac{1}{4}$	3	39	5	14	12		
169	0		2	5	16	2	0	4	$\frac{1}{2}$		21	5	14			
174	0		2	4	16	1	1	3	2	4	1		23		13	7
180	0	5	8	5	16		2	1	4	2	$1\frac{1}{2}$		32	1	13	
186	1	5	11	1	16	3	2	2	4	4	$1\frac{3}{4}$		36	3	13	2
192	2		12	5	16	2	2		4		$1\frac{1}{2}$		37	1	13	
198	0	4	14		16	2	0	3	1	5	$\frac{2}{3}$		23	2	13	9
204	1	4	14		16		0	5	4		1		31	3	14	

The daily proportions of cream and skim-milk for each pound of weight are shown in the following analysis:

Weight, lbs.....	$8\frac{1}{2}$	$9\frac{1}{2}$	$10\frac{3}{4}$	$11\frac{3}{4}$	$12\frac{1}{2}$	$13\frac{3}{4}$	$14\frac{1}{2}$
Cream, teaspoons...	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$\frac{3}{4}$	1
Skim-milk, teas.....	$2\frac{1}{2}$	$6\frac{1}{4}$	$7\frac{1}{2}$	8	$9\frac{1}{4}$	$4\frac{1}{2}$	$6\frac{3}{4}$
Total.....	$2\frac{3}{4}$	$6\frac{3}{4}$	$8\frac{1}{4}$	9	$10\frac{1}{2}$	$5\frac{1}{4}$	$7\frac{3}{4}$

Milk-sugar varied from one-seventeenth to one-twentieth of the food and water combined.

Water was gradually decreased as the child became older and demanded a stronger food.

Where overfeeding caused foul, splashy stools and some fever, the food was reduced, but these reductions in food were replaced by warm water to satisfy the intense thirst caused by loose bowels. Where nausea and vomiting accompany frequent stools, all foods and drink must be reduced inside the vomiting point, even if this demands total absence of everything for a day and night. Additions after this must always be governed by the ability of the stomach to retain what is received, no matter how small this amount may be.

Infants generally thrive best when the bulk of the food is not more than two and one-half to three ounces daily for each pound they weigh.

This infant was nursed entirely until fifty-six days old and suffered greatly from colic due to the quality of the mother's milk. He had frequent green stools and much gas passed from the bowels. Nursing was reduced and partial substitute feeding added. After about four weeks more, nursing was stopped entirely.

The occasional decreases in the different foods were due to over-feeding, as shown by extra gas and foul, soft stools, frequently green in color and either mucous or splashy in character.

This schedule illustrates the reverses following these errors as well as the good results that follow smaller amounts of cream, skim-milk and sugar when perfectly digested and only sufficient given to make a happy child.

No infant can be happy when underfed any more than when overfed.

Overfeeding of skim-milk is shown at 114 days, as proven by three foul stools daily. At this time, he weighed twelve and one-half pounds and was fed nearly twenty-three ounces of cream and milk or nearly two ounces daily for each pound of weight. This was too high and both were quickly reduced until he was taking only twenty ounces daily. They were farther reduced to eighteen ounces at 162 days. During these reductions, he gained steadily till he weighed fourteen and three-fourths pounds and was taking one and one-fourth ounces daily of cream and skim-milk for each pound of his weight.

The general tendency in this case was to feed too much and the reductions in food were not great enough to avoid sickness. At 162 days, vomiting with foul, mucous, watery stools demanded a large reduction of the food and the weight fell from 14.12 to 13 pounds. It was necessary to reduce the food more than one-half before the one natural stool daily was obtained. This required over two weeks before food could be again increased and starch added to the dietary. As starch was increased, the sugar was decreased and a reduced ratio of skim-milk and cream was maintained.

The parents profited by their past experience in overfeeding and avoided future mistakes by always stopping the increases of food as soon as extra gas, passed by mouth or anus, showed decomposition of food or the infant became restless in daytime and sleepless at night. By this care, he grew to be a large, strong boy and required no medical care after the sickness when six months old.

The milk in this schedule was Jersey and measured with

spoons. The cream was increased when needed to soften the stools and overcome constipation, and lessened when the stools became foul and soft or the infant cross and colicky or vomited the food. The weight increased steadily for 162 days. It will be noted that for several weeks at that time, all foods bore too high percentages to the weight and were evidently greater than the quantity of digestive fluids secreted could convert into healthy nutriment. The usual decomposition of food followed, causing indigestion with consequent foul diarrhea and loss of weight. The record shows that it required thirty days of careful feeding before the infant again commenced to make weight.

By decreasing sugar as starch was added, judiciously increasing all foods and gradually adding solids after eight months, this baby became a strong, vigorous one, living entirely upon solid foods and milk when fifteen months old. The writer saw him only a few times after first arranging his diet.

578.

## SCHEDULE No. 6

Age, days	Cream,		Skim- milk,		Boiling water,		Lime- water,		Milk- sugar,		Total Amount,		Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.		oz.	tea.	lbs.	oz.
122	2	2	6	4	20	1	2	2	1½		31	3	10	
128	2	4	9		22	3	2	4	1½		36	5	10	8
134	2	5	9	3	25	2	1	5	2		39	3	10	12
140	3		11	1	27	2	2		2		43	3	11	4
146	3		11	3	23		2		2		39	3	11	10
152	3		10		26	3	1	5	2		41	2	11	12
158	2	5	10	1	24	5	1	5	1¾		39	4	11	15
164	2	5	10		25	4	2		2		40	3	12	1
170	3	2	10	4	22		2		2		38		12	12
176	3	2	11	2	21	2	2		2		38		12	12
182	4		12		22	3	2		2		40	3	13	1
188	2	5	8		24	4	2		1½		37	3	13	8

This infant had been fed various proportions of cream, milk, sugar and starch until he was four months old and the increase in weight was very slow.

While using this schedule, the milk was mostly Jersey and taken from two dealers, but showed no difference in results, and the infant grew steadily and was so happy that the mother soon tired of filling the charts showing its progress. She lived in the country twenty miles away and called only once in ten days.

It will be seen that the amount of food given daily was:

Cream  $1\frac{1}{3}$  to  $1\frac{3}{4}$  } Teaspoons for each pound in weight  
 Skim-milk  $5\frac{1}{4}$  " 6 } of child.

Milk-sugar was about one-twentieth of the whole food mixture.

The apparent reductions in the amount of food fed each day were due to lessening the water and thus making a more concentrated food. The meals were too large in bulk, but as he had been very much overfed during the first four months, it was difficult to reduce them enough and still satisfy the demands of an enlarged stomach.

579.

## SCHEDULE No. 7

Age, days	Cream,		Skim- milk,		Boiling water,		Lime- water,		Starch,		Milk- sugar,	Solid Food	Total Amount		Weight,	
	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.	tea.	oz.		oz.	tea.	lbs.	oz.
37	1	3	2		9		1				$\frac{3}{4}$		13	3	8	
42	2		2	3	12		1				1		17	3	8	12
48	2		2	4	12		1				1		17	4	9	8
56	2		3		13		1				1		19		10	
63	1	3	3	1	14		1				1		19	4	10	8
70	1	4	3	3	14	3	1				1		20	4	10	14
76	1	5	3	4	15		1				1		21	3	11	4
85	2		4		14	3	1				1		21	3	11	14
91	2		4	4	14		1				1		21	4	12	2
98	2	3	5	1	14		1				1		22	4	12	5
105	3		6		13		1				$1\frac{2}{3}$		23		13	
112	3		6	1	12		1				$1\frac{2}{3}$		22	1	13	4
119	3		6	3	10		1				2		20	3	13	12
126	2		7		11	3	1				2		21	3	14	
133	1		7	2	13		1	3			2		22	5	14	4
140	0		14		24		2				$1\frac{3}{4}$		40		14	10
147	0		17	3	23		2				$1\frac{2}{3}$		42	3	15	
154	0		18	2	23		2				$1\frac{2}{3}$		43	2	15	5
164	0		15	4	25	4	2				2		43	2	15	10



## SCHEDULE No. 7—Continued

Age, days	Cream, oz. tea.	Skim- milk, oz. tea.	Boiling water, oz. tea.	Lime- water, oz. tea.	Starch, oz. tea.	Milk- sugar, oz. tea.	Solid Food	Total Amount oz. tea.	Weight, lbs. oz.
173	0	16 2	25 4	2		2		44	15 13
181	0	17 3	26 2	2 2		2		46 1	16
189	0	19	27 4	2 2		2		49	16 4
196	0	21 2	31 2	2 2		2 1/4		55	17
202	0	24 3	31 2	2 1		2 1/2		58	17
209	0	24 2	30	2		2 1/4		56 2	17 3
216	0	23	29	2	Rice water and oat water	2		54	17 6
224	0	22 3	28 3	2		1 3/4		53	17 10
231	0	23 2	27 4	2		1 3/4		53	18 8
238	0	26	27 3	2	1	1 1/2		56 3	18 10
245	0	28	25	2	3	1 1/4		58	19 12
252	0	28	23	2	5	1		58	20
259	Crusts,	29	21 4	2	7 2	1/3		60	20 8
266	toast,	29	20 4	2	8 2	1/3		60	20 12
272	bread,	30 2	19 2	2	10 5	1/3		62 3	20 12
279	crack- ers and	30 2	18 3	2	11 4	1/4		62 3	21
286	dry	31 2	18 1	2	13 3	0		65	21 6
293	starches of all kinds	32	16 3	2 1	17 2	0		68	21 10
302		33 2	14 4	2 2	19 4	0		70	22
310		34 5	12 2	2 3	22 2	0		72	22 8
316		34 5	9 5	2 3	24 5	0		72	22 8
322		31 3	9	2 2	22 3	0		65 2	22 8
328		31 2	7 5	2 1	23 3	0		64 5	22 8
334		31 2	5 4	2 1	25 4	0		64 5	22 8
341		30 3	4	2	26 3	0		63	
349		30	2	2	27 3	0		61 3	
357		30	1	2	28 3	0		61 3	
365		28 4	0	2 3	28 5	0		60	23
371		27	0	3	33	0		63	
377		14 2	0	3 4	50	0		68	23
383		19 1	0	3 2	43	0		65 3	
389		20 1	0	3	36 3	0		59 4	
396		18 2	0	2 3	35 1	0		56	
403		17	0	2 2	33 1	0		52 3	23
409		15 2	0	2	30 4	0		48	23
415		17 5	0	2 2	31 5	0	Eggs, bread, crack- ers, toast, po- tatoes	52	24 8
421		15 2	0	2	26 4	0		44	24 8
427		15	0	2	27	0		44	25
433		15	0	2	27	0		44	26
439		15	0	2	27	0		44	26
445		15	0	2	27	0		44	26
452		12 3	0	1 3	22	0		36	26
458		11 1	0	1 2	19 3	0		32	26 8
464		7 4	0	2	26 2	0		36	26 8

Complete weaning was accomplished with this child when he was 140 days old.



The following analysis shows the amount of food fed daily at different ages for each pound of the infant's weight:

Age.....	37 days	2 months	3 months	4 months	5 months	6 months	7 months
Weight, lbs.....	8	10½	12⅛	13¾	15¼	16	17½
Cream, teaspoons.....	1	1	1	1¼	0	0	0
Skim-milk, teaspoons.....	1½	1¾	2⅓	2¾	7	6½	8
Total .....	2½	2¾	3⅓	4	7	6½	8

Age, months.....	8	9	10	11	12	13	14	15
Weight, lbs.....	19¾	20¾	22	22½	23	23	24½	26
Cream, teaspoons.....	0	0	0	0	0	0	0	0
Skim-milk. ....	8½	8¾	9	8⅓	7½	5¼	3¾	3½
Total .....	8½	8¾	9	8⅓	7½	5¼	3¾	3½

Milk-sugar varied from one-eighteenth during the first two months to one-twenty-third at six months of the food and water combined.

A comparison of the amounts of skim-milk fed with those amounts of it and cream fed to the infants in the other schedule shows, beyond a doubt, that very little of the cream was removed in the process of setting the milk for this infant. One great advantage this child enjoyed was the newness, richness and purity of the milk. This is always an immense assistance in feeding an infant, which mothers living in large cities can seldom enjoy. The milk was always used in its raw state, but pepsin was given at times to assist the digestion.

This baby lived 150 miles distant from the writer, who was called to arrange his diet when he was thirty-six days old. He was nursing his mother, but her milk was insufficient and also of poor quality and he was suffering continually from colic and green, slimy stools.

As the parents owned their own cow, partly Jersey in breed, she supplied all the fresh milk necessary for the food. The cow's food was hay or grass, with bran or ground grain as a mash, and the milk was rich in fat.

This infant proved to have very good digestive organs and his progress was continually forward, with the exception of slight digestive disturbances when fed too much. He had no sickness of any kind until he was nearly two years old. He was nursed partly during the first four and one-half months. Increases of cream were borne well until he was four months old, when it caused vomiting and some looseness of the bowels; but, as the mother was a very generous feeder, believing fully in the necessity of feeding plenty of cream, this overfeeding was not surprising. As she set the milk for a few hours in order to remove the cream, she was not particular in the time she waited or in taking it all off when she skimmed the milk. This will explain the absence of cream in the dietary after four months. Evidently, enough of it was left in the skim-milk to meet all the necessities of the infant.

Skim-milk was fed to the highest point possible without producing curds or foul-smelling stools, and as it was always new and clean, it was given in its raw state. The amount of it fed in this case, from nine to twelve months, was higher than usual with such rich Jersey milk, and was more than was beneficial to the infant, for it will be noted that the advances in weight were slow, or none, until this food, and water also, were reduced in quantity and starch increased when the child was about a year old.

The proportion of milk-sugar was higher than was commonly given, as the baby seemed to digest it perfectly and thrive well. It varied from about one-tenth to one-twenty-

fifth of the whole day's food, but the high percentage was evidently too much, as it was continued only for a short time when the baby was 110 to 130 days old. Over-feeding of sugar, as usual, caused redness and irritation about the rectum and also soft, splashy stools. It was gradually reduced and finally omitted as starch was sufficiently increased.

Rice and oat water were gradually introduced after seven months. They were used in combination or separately as the stools demanded the softening qualities of the oatmeal or the drying qualities of the rice. Bread crumbs and crackers were also commenced in small quantities at nine months and other substitute foods, such as eggs and potatoes, were added.

This infant was on a practically solid dietary when it was fifteen months old. The starch-waters were commenced in standard strength—one tablespoonful of the meal or flour, or two tablespoonfuls of the flakes, to one pint of water—but this strength was increased as the infant grew older and demanded more food to carry it from one meal to the next.

As this child was seen by the writer only once, all farther changes in the diet were made from the charts which the mother filled regularly and forwarded by mail.

## INFANTS WHO DO NOT GROW

580. This is a condition which appears in many infants and causes mothers very frequently to increase the food beyond the limited amounts which are safe for the little one. They do this because they think the failure to grow is entirely due to an insufficiency of food. The foregoing schedules, it is hoped, will be a general guide to mothers

regarding the amount that is sufficient according to the infant's weight. They also show where infants grow as well, or better, on reduced amounts of food.

Where an infant does not grow when, apparently, receiving enough food, mothers should remember that foods of the same name and of equal weight are not always the same strength or do not carry equal nourishing powers. This is strongly illustrated in paragraph 133, showing the great variation in strengths of different samples of milks.

Where an infant is receiving enough food as per schedules and shows no increase in weight, the foods should be changed gradually for others of the same name; milk-sugar replaced by cane-sugar or grape-sugar; that is, a malted starch, such as Mellin's Food; cream or butter fat by cod liver oil or sweet oil; proteids by another sample of skim-milk or a newer one, by meat teas or juices or by egg albumens; and baked or boiled starches by those differently prepared or those having a different flavor and taste. These changes should always be made before increasing the food beyond reasonable amounts.

#### ADVANTAGES OF DRY FOODS

581. The hand-fed infant is consuming the same foods as the adult, even though not in the same form. The salivary secretions commence about the third month, and by this, nature shows her readiness to digest some starch. When starch is mixed with milk, the length of time it remains in the mouth is not sufficient to accomplish the dextrinizing action of the saliva. How much saliva is drawn by the nursing process cannot be ascertained, but it cannot be equal to that demanded by dry food (302). In order to utilize the saliva, an effort should be made to feed

starch in the dry form as soon as the infant will accept it after drooling commences, usually about the eighth month. This can be done by using bread crusts or crumbs, gluten biscuit, crackers, toast, etc., all of which demand saliva to moisten them and thus stimulate a large salivary secretion which quickly dextrinizes all forms of starchy foods. This is always the first change requisite in converting this food into healthy aliment (252).

582. Another very decided advantage in feeding the dry starches is the stimulating influence which new tastes in foods give to the secretion of digestive fluids. This is similar to the experience of the adult who enjoys a fresh relish for each new course at the dinner table. Even though the foods be all starch, the new forms and flavors stimulate the infant to better digestion, and, consequently, give better results than when only one form is continued for a long time without any change.

583. In the foregoing schedules, different varieties of starch were used with the milk as long as they produced healthy stools, and as soon as the infant would take dry bread or cracker crumbs, they were given regularly every day. Very great harm is continually done by giving bottle food too liberally, too dilute or too long, and mothers must be careful to reduce the size of some meals when they add any quantity of dry starches to the daily dietary.

#### FILLED CHARTS

The following five filled charts show the actual work of as many mothers. Some show good and others fair progress and illustrate the advances of different infants according to their digestive power.

584. BABY H—D, Residence\_\_\_\_\_ Age 10 weeks

[illegible]

28. Temper	{ Good. Cross.	Good	Good	Good	Good	Good	Good	Good
29. Hungry Before Meals	{ How Many Min't's	5—10	5—10	10—15	5—10	5—10	5—10	5

This infant was hand-fed from birth. He had difficulty in digesting his food during the first two weeks, as he had many green, mucous stools with much colic. His food was not peptonized at that time and when two weeks old, six ounces of human milk were added to his dietary daily. After this, his stools became yellow and only an occasional green one appeared. When five weeks old, the cow's milk was peptonized, and from that time he remained always happy and his growth was so rapid that the only apprehension was lest he should grow too rapidly. Peptonizing was continued for six months. Human milk was stopped at three months. He had great digestive power and demanded so much food that the rule to increase food only at one point in any day was not observed. This would be dangerous with a weak digester.

His chart shows the following important features:

1st.—Food increased in quality and quantity on the same day. This was possible when human milk was part of the dietary in an infant with good digestive power.

2d.—Irregularity in number of stools is safe with human milk but not when it is absent.

3d.—Item 22 shows soft stools. This is also due to the human milk and safe when the odor is natural, thus showing no decomposition of the food.

4th.—Item 26 shows a little gas coming up. This was due to crowding the stomach a little too much. Item 29 shows he was fed as soon as he became hungry. This could not have been done with soft stools except when made from human milk.



1. Year 1905.....	Day						
Month April....	29	30	1	2	3	4	5
2. Cream.....	Oz. Tea 1 3	Oz. Tea 1 3	Oz. Tea 1 3	Oz. Tea 2	Oz. Tea 1 3	Oz. Tea 1 3	Oz. Tea 1 3
3. Human milk....							
4. Skim-milk.....	7 2	7 3	7 3	8 5	7 4	7 4	7 4
5. Whey.....							
6. Lime-water.....	2 0	2 0	2 0	2 0	2	2	2
7. Boiling water...	20	20	20	25	20	20	20
8. Sugar { milk....	1 3	1 3	1 3	1 3	1 3	1 3	1 3
{ cane....							
9. { Starch.....							
{ Flour.....			0 1	0 1	0 2	0 2	0 2
10. Unused Food...							
11. { Albumen.....							
{ Beef Tea.....							
{ Beef Juice....							
12. Feed How Often							
13. Day Meals.....							
6 A. M. { No.	7	7	7	7	7	7	7
to							
6 P. M. { Size	*15 17	15 17	16 17	16 17	17	17	17
14. Night { No.	3	3	3	3	3	3	3
Meals { Size	*22	22	23	23	23	23	23
15. Whole Day's Food.....	29 1	29 1	30 3	31 2	31 2	31 2	31 2
16. Spits.....	No	No	No	No	No	No	No
Vomiting.....	"	"	"	"	"	"	"
17. Whole Number of Meals.....	10	10	10	10	10	10	10
18. Medicine.....	0	0	0	0	0	0	0
19. No. of Stools....	1	1	1	1	1	1	1
20. Color.....	Yel.	Yel.	Yel.	Yel.	Yel.	Yel.	Yel.
21. Odor { Natural.	Nat.	Nat.	Nat.	Nat.	Nat.	Nat.	Nat.
{ Foul....							
22. Kind { Splashy..							
{ Soft.....							
{ Formed..	Formed	Formed	Formed	Formed	Formed	Formed	Formed
23. Collc { Yes.....							
{ No.....	No	No	No	No	No	No	No
24. Weight.....	lb. oz. 8 12	lb. oz. 8 11	lb. oz. 8 12	lb. oz. 8 13	lb. oz. 8 14	lb. oz. 8 15	lb. 9
25. Gas { Natural...	Nat.	Nat.	Nat.	Nat.	Nat.	Nat.	Nat.
{ More.....							
26. Gas { Up.....	Nat.	Nat.	Nat.	Nat.	Nat.	Nat.	Nat.
{ Down....							



27. Sleep	{ Day.... Night...	Good "	Good "	Good "	Good "	Good "	Good "	Good "
28. Temper	{ Good . Cross .	Good	Good	Good	Good	Good	Good	Good
29. Hungry	{ How Before { Many Meals { Min't's	15	15	5	5	5	5	5
30. Temperature....								
31. Urine	{ Natural . Strong..							
32. Genitals .....								
33. Abdomen.....								
34. Skin.....								
35. Head.....								
36. Veins.....								
37. Flesh.....								
38. Bones .....								

\* Figures in 13 and 14 indicate teaspoons.

6 flat teaspoons or 2 flat tablespoons make one ounce.

This is the second infant in this family. The mother brought her first infant to the writer when four months old in a very emaciated and distressing condition, due to over-feeding it. On a very much reduced diet, she succeeded in making the infant happy and grow satisfactorily. This experience caused her to be over-careful in the amounts fed daily to this infant.

She nursed it for a month, but as the baby had green stools all the time, suffered greatly from colic and did not grow, she was compelled to wean it. She then commenced feeding modified milk, but was unfortunate in getting poor milk from two careless, dirty dealers. In one bottle she found the green milk tickets which she had placed there to pay for the milk. The milk dealer had poured the milk into the bottle without any washing and brought it back next day. This arsenical milk-ticket juice caused a

diarrhea and vomiting. After a change to good milk, the mother was afraid to increase the food fast enough to give weight, although the chart shows everything correctly done.

The following changes on the chart are important. Reading from left to right shows correct answers in the resulting items 16, 19, 20, 21, 22, 23, 25, 26, 27 and 28. Such answers show perfect digestion and call for increase in food, such as are shown in items 9, 13, 14 and 15. Where the resulting items are correct, the increases may be made at two points, such as items 9 and 17, till the weight shows an increase of one ounce daily. After this, it is necessary that advances be made at only one point; that is, increase the whole amount of food or only one food each day; and this can be continued so long as the resulting items read correctly.

The reader will notice that in item 29, as soon as the child was fed within five minutes after becoming hungry, she increased in weight steadily.

586. BABY L., Residence \_\_\_\_\_ Age 5 weeks

1. Year 1905..... Month April....	Day 24	25	26	27	28	29	30
	Oz. Tea 4	Oz. Tea 4	Oz. Tea 4	Oz. Tea 4	Oz. Tea 4	Oz. Tea 4	Oz. Tea 4
2. Cream.....							
3. Human milk....							
4. Skim-milk.....	0 4	1 0	1	1	1	1	1
5. Whey .....							
6. Lime-water.....	0	0	0	0	0	0	0
7. Boiling water...	18	18	18	19	19	19	19
8. Sugar { milk.... { cane....	0 4½ 0	0 4½	0 4½	0 4½	0 4½	0 4½	0 4½
9. Starch .....							
10. Unused Food...							
11. { Albumen..... { Beef Tea..... { Beef Juice.....							
12. Feed How Often							

13. Day Meals.....													
6 A. M. { No.	7		7		6		6		6		6		
to													
6 P. M. { Size	*10	11	10	12	10	12	11	13	11	13	12	13	
14. Night { No.	4		4		5		4		5		4		
Meals { Size	*12	13	10	13	10	13	11	13	10	13	12	13	
15. Whole Day's Food.....	20	4	21		20	5	20	1	21	4	20	2	
16. Spits.....	0		0		0		0		0		0		
Vomiting.....	0		0		0		0		0		0		
17. Whole Number of Meals.....	11		11		11		10		11		10		
18. Medicine.....	Peptonizing Powder												
19. No. of Stools ...	2		2		3		3		2		2		
20. Color.....	Yel.		Yel.		Yel.		Yel.		Yel.		Yel.		
21. Odor { Natural..	Nat.		Nat.		Nat.		Nat.		Nat.		Nat.		
{ Foul ....													
22. Kind { Splashy..													
{ Soft .....													
{ Formed..	Formed		Formed		Formed		Formed		Formed		Formed		
23. Colic { Yes .....	No		No		No		No		No		No		
{ No.....													
24. Weight.....	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	
	7	5	7	7	7	8	7	9	7	10	7	9	
25. Gas { Natural...	Nat.		Nat.		Nat.		Nat.		Nat.		Nat.		
{ More.....													
26. Gas { Up .....													
{ Down ....													
27. Sleep { Day .....	Good		Good		Good		Good		Good		Good		
{ Night ...	"		"		"		"		"		"		
28. Temper { Good.	Good		Good		Good		Good		Good		Good		
{ Cross.													
29. Hungry { How													
Before { Many													
Meals { Min't's	5		5		5		5		5		5—10		
30. Temperature....													
31. Urine { Natural.													
{ Strong.													
32. Genitals .....													
33. Abdomen.....													
34. Skin.....													
35. Head.....													
36. Veins.....													
37. Flesh.....													
38. Bones .....													

\* The figures in 13 and 14 indicate teaspoons.

6 flat teaspoons or 2 flat tablespoons make one ounce.

This little fellow was hand-fed from birth. His mother had great trouble in feeding an older child, and, consequently, was prepared for correct work with this one. This chart shows correct work done by an intelligent nurse. It illustrates proportions of foods at this age and good results following their use.

The reader will note the following points: ;

1st.—Increases in skim-milk and the whole amount of food daily on the 25th. This was wrong, as the weight increased 2 ounces on that day, but was corrected by increasing item 7 next day, thus diluting the food.

2d.—Item 15 was increased rapidly, as baby had not been growing as much as is desirable at that age. This rapidity is allowable for a week or ten days only.

3rd.—Irregularity in number of meals, item 17, is wrong, but is unavoidable here as baby became hungry before 6 A. M., some days and after on other days. He was, properly speaking, taking ten and one-half meals daily.

4th.—Item 18. Peptonization of the milk and cream was needed to remove green color from the stools and check the colic from which he suffered during the first two weeks.

5th.—All the answers showing results are correct and thus allowed the baby to be always fed as soon as he became hungry.

587. BABY G., Residence \_\_\_\_\_ Age 7 weeks

1. Year..... Month, Sept.....	Day 6	7	8	9	10	11	12
	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1
2. Cream.....							
3. Human milk....	6	6	6	6	6	6	6
4. Skim-milk.....	2 3	2 3	3 0	2	2	2	2 1½
5. Whey.....							

6. Lime-water.....	2	2	2	2	2	2	2
7. Boiling water...	18	18	18	18	18	18	18
8. Sugar { milk.... { cane....							
9. Starch.....							
10. Unused Food...							
11. { Albumen..... { Beef Tea..... { Beef Juice....							
12. Feed How Often							
13. Day Meals..... 6 A. M. { No. to 6 P. M. { Size	7 *6 21	7 6 21	8 9 15	6 12 15	7 6 15	7 9 15	7 9 15
14. Night Meals { No. { Size	6 *12 18	5 12 21	3 12 15	5 12 15	5 12 15	6 6 18	7 6 18
15. Whole Day's Food.....	28 3	26 0	24 3	23 3	24 3	27 3	26 3
16. Spits..... Vomiting.....	1	2	1	3	1	1	1
17. Whole Number of Meals.....	13	12	12	11	12	14	14
18. Medicine.....							
19. No. of Stools...	2	2	3	2	2	1	2
20. Color.....	1 yel. 1 dark	Yel.	Dark	Green	Green	Dark	Dark
21. Odor { Natural.. { Foul....	Foul	Foul	Foul	Foul	Foul	Foul	Nat.
22. Kind { Splashy.. { Soft..... { Formed..	Soft	Soft	1 soft Formed	Splashy	Splashy	Soft	Soft Formed
23. Colic { Yes..... { No.....	No	Yes	Yes	No	No	No	No
24. Weight.....	lb. oz. 9	lb. oz. 8 12	lb. oz. 8 12	lb. oz. 8 12	lb. oz. 8 12	lb. oz. 8 12	lb. oz. 8 12
25. Gas { Natural... { More.....	Nat.	Nat.	More	More	Nat.	Nat.	Nat.
26. Gas { Up..... { Down.....	Yes		Yes	Yes	Yes	Yes	Yes
27. Sleep { Day..... { Night....	Fair Good	Fair Good	Fair Good	Poor Good	Fair Good	Fair Good	Good Good
28. Temper { Good.. { Cross..	Good	Cross	Cross	Good	Cross	Cross	Good
29. Hungry { How Before Meals { Min't's	15	15	15to20	20	15	15	15

\* Teaspoonfuls.

This is the second baby of parents who were very anxious and worried because they had lost their first one through unsuitable dietary. As the mother had not enough nurse for it and also because what she did give disagreed, the infant was weaned. A milk mixture was tried and failed to satisfy or nourish it. When he was six weeks old, the writer first saw the little one. He was very pale and thin, though a large baby.

This chart is shown as an illustration of what was done by an over-anxious mother, worried and losing her sleep. The cries of the infant caused by indigestion, were mistaken for hunger and too much food was given. Vomiting warned her of overfeeding, but her desire to feed more caused her to repeat this mistake again as soon as there was less vomiting.

The general irregularity in items 15 and 17 caused bad and irregular results, as shown in items 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28 and 29. In none of these items does the work show good results nor yet does the child improve. The good effects which should follow lessening of sugar and skim-milk were entirely frustrated by the irregular amounts fed from day to day. This mother was like many others, too anxious, and not having fixed ideas of what was right, changed her plans continually with the cries of the infant or the importunities of friends. In a few weeks, she became tired of this and realized that she must follow the physician's directions or lose her infant. She then did systematic work and only made such changes as the stools and comfort of the baby demanded. From this time forward, her progress was satisfactory and her baby thrived perfectly.

The general directions given her were to lessen some or

all of the foods till the gassy condition was removed and the stools showed formation, and then to increase gradually inside the gassy condition, always keeping the stools formed. This plan was successful and made a happy mother as well as a happy child.

588. BABY H—Y., Residence \_\_\_\_\_ Age 20 weeks

1. Year 1904..... Month Nov....	Day 18	19	20	21	22	23	24
	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1 1	Oz. Tea 1 2	Oz. Tea 1 3	Oz. Tea 1 3
2. Cream.....							
3. Human milk....							
4. Skim-milk.....	14	14	14	14	14	14	14
5. Whey .....							
6. Lime-water ....	2	2	2	2	2	2	2
7. Boiling water...	24	24	24	24	24	24	24
8. Sugar { Milk.... { Cane..	2	2	2	2	2	2	2
9. Starch { Imp.... { Gran...	0 3	0 3	0 3	0 3	0 3	0 3	0 3
10. Unused Food...							
11. { Albumen .....							
{ Beef Tea.....							
{ Beef Juice....							
12. Feed How Often							
13. Day Meals..... 6 A. M. { No. to 6 P. M. { Size	4 3 3 2½	5 2 3 2½	6 1 3 2½	3 4 2½ 3	6 1 3 4½	5 1 3½ 4	5 1 1 3 3½ 4
14. Night { No. Meals { Size	4 1 4 2½	4 4	4	5 4	3 5	3 5	3 1 5 3
15. Whole Day's Food .....	38	36	36 3	39 3	37 3	36 3	40 3
16. Spits.....	1	2	0	3	0	0	3
Vomiting.....	0	0	0	0	0	0	0
17. Whole Number of Meals.....	12	11	10	12	10	10	11
18. Medicine.....	Peptonized the Milk.						
19. No. of Stools...	1	1	1	1	2	2	2
20. Color.....	Yel.	Yel.	Yel.	Yel.	Yel.	Yel.	Yel.
21. Odor { Natural. { Foul....	Nat.	Nat.	Nat.	Nat.	Foul	Foul	Foul
22. Kind { Splashy.. { Soft..... { Formed..					Soft	Soft	Formed
	Formed	Formed	Formed	Formed			



23. Colic	{ Yes .....	No	No	No	No	Yes	Yes	No
	{ No .....	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
24. Weight .....		9 7	9 12	9 12	9 11	9 11	9 11	9 11½
25. Gas	{ Natural...				Nat.	Nat.	Nat.	Nat.
	{ More....	More	More	More				
26. Gas	{ Up .....							
	{ Down....	Both	Both	Both	Both	Both	Both	Both
27. Sleep	{ Day.....					Well	Fair	Good
	{ Night....	Fair	Fair	Well	Poor	Poor	"	"
28. Temper	{ Good.	Good	Good	Good			Good	
	{ Cross				Cross	Cross		Fair
29. Hungry	{ How	Could not tell.						
	{ Before							
	{ Many							
30. Temperature....	Meals { Min't's							
31. Urine	{ Natural.							
	{ Strong .							
32. Genitals.....								
33. Abdomen.....								
34. Skin.....								
35. Head.....								
36. Veins.....								
37. Flesh.....								
38. Bones.....								

6 flat teaspoons or 2 flat tablespoons make 1 ounce.

This infant nursed a few weeks, was then weaned and fed a cream mixture, but, as they were living at their summer home, they could not control the milk supply. As the mother was sick herself, the baby did not progress satisfactorily. A short review of the different items reveals some of the difficulties appearing commonly in infants who are unsuccessfully nursed and also improperly fed afterwards.

Item 2 shows a low amount of cream. This always follows overfeeding of this item and the daily amount never reached 2 ounces.

Item 4. Skim-milk is high, being nearly 1½ ounces daily for each pound of the infant's weight. When he was ten months old and weighed eighteen pounds, he could not take 16 ounces daily. His power to digest milk foods was poor.

Item 5. Irregularity in amounts fed daily is always a failure if continued long.

Item 6 shows the stomach was overloaded on some days.

Item 7. The proportion of water must always be high when correcting errors from overfeeding where too large meals are given. It was gradually reduced.

Item 8 shows full proportion of sugar. This item had been fed too low.

Item 9. Imperial granum, rice flour and oat flakes were gradually increased as he grew in weight.

Item 13 shows irregularity in size and number of meals. This is the usual experience of a mother when finding the amount suited to impaired digestive secretions.

Item 17. The number of meals must be uniform. Only reductions in number are correct as age increases.

Item 18. Milk must always be predigested when digestion of it is imperfect.

Item 19. The increased food of the 21st was not all digested and two soft, foul stools followed on the 22nd and 23rd, with some colic also.

Item 24. Evidently, weighing was not correctly done on the 18th, as there could not be a 5-ounce advance in actual weight in one day. The uniformity in weight after the 21st shows correct weighing, but also shows no advance. This is always the result with the irregularities shown in items 15 and 17. A continual advance in food which produces correct stools is necessary to secure steadily increasing weight.

The irregularities in items 25, 26, 27 and 28 always follow irregularities in items 15 and 17, and it is impossible to answer item 29 when the stomach is not healthy or is improperly used.

## CHAPTER IX

### SUMMARY

#### FEEDING RULES

589. No. 1.—Slow feeding always; intervals of amusement between courses; no bolting of food.

590. No. 2—All food which does not melt down with water must be thoroughly softened by cooking and mashing. Children seldom chew their food enough.

591. No. 3—Never urge a child to eat more. Do not procure other foods when the proper ones are refused. Change the food at the next meal, if it is a fatty one like those made with cream dressings. Never tempt the appetite with fruits (774) or sweet goods (772); always wait till the next meal, when a good appetite is present. If food is refused, do not lunch between meals. Always feed *only that amount which will secure a good appetite for the next meal*. Avoid night feeding after the first six months, as it always causes wakeful habits, and a cross, irritable and unsuccessful child.

592. No. 4—Sore mouth or throat demands liquid foods. Acute illness calls for a reduction of food and more drinks. Severe illness requires drinks only during the first few days and diluted milk or thin gruel as the sole diet afterwards.

593. No. 5—Hot weather always requires sterilized milk (148), smaller meals and more water in or with the food. A reduced milk dietary and more water are essential to maintain good health in summer (279).

594. What will you feed the newly-born baby?

Four to five teaspoons of sugar-water at each feeding (408).

One meal every six to eight hours the first day; the same amount every three to four hours the second day with half teaspoon of very thick cream; the same food on the third day, only more frequently, unless the mother is able to nurse the baby part of the time.

595. If the mother's milk is not sufficient on the fourth day, what is the prospect of her being able to nurse the baby?

Most mothers, whose breasts are not crowded full with milk on the fourth day, will be unable to nurse their infants perfectly.

596. Is it right for a mother to nurse her infant partly when she has not an abundance of milk?

Yes; if her milk makes the infant sleep quietly and produces yellow stools; but, if it causes green, mucous or slimy stools after nursing three or four days, it is a great mistake for her to continue, as the more she nurses, the more injury will it cause to the future digestive power of the infant when the stools always continue to be green and slimy (35).

597. Do you consider green stools in the nursing infant proof of unsuitable dietary?

Yes; green in the stools is usually proof of unsuitable quality of milk. When accompanied by mucus or slime, it causes colic and crossness. A little green mixed with yellow stool, when there is no mucus therein, is not wrong; but green, mucous or slimy stools without any yellow color are always evidence of a serious condition. The danger grows in proportion with the increase of green and the absence of yellow (100).

598. Do green stools always show that the error lies in the food?

No; many infants have very imperfectly developed digestive glands when born and cannot properly digest even good human milk (188).

599. What food usually causes green in the stools of a healthy infant?

Usually it is caused by excessive proteids in the mother's milk or by too much skim-milk in the dietary of the hand-fed infant.

600. Can the milk of the mother be improved so as to correct the digestion and avoid green stools in the infant?

In many cases it can, where only parts of the stool show the green, slimy character. Changes in the food and avoidance of all medicine often give this improvement (42). Stools which are all or nearly all green and slimy usually demand weaning.

601. If these changes do not give healthy stools, what should be done?

The infant should be partly fed on a cow's milk and cream mixture until the weak, tired mother regains her strength and is able to take exercise in the open air. These mothers often secrete a poor quality of milk, which causes green stools only temporarily (92).

602. What foods should the nursing mother avoid?

She should avoid fruits, cabbage, pickles, tomatoes and all sour drinks, as well as hearty meals which may cause indigestion. The mother suffering from indigestion always gives a colicky milk. Coffee is not a suitable drink and neither is milk (55). Meats, milk and eggs should be used in moderation, as much animal food makes a colicky milk (53).

603. What drinks are most suitable to increase the mother's milk?

Well-boiled gruels seasoned with milk or cream give the best results. They increase the amount and quality of the milk. Weak tea is also beneficial for this purpose (56). Beer and malt extract make more milk, but generally a poor quality.

604. Will careful dieting of the mother improve the quality of her milk?

Yes; if she naturally secretes a suitable milk; but it will cause little improvement in a milk which always makes green, colicky, mucous stools (53).

605. In what way must such infants be managed and fed?

These infants must be weighed regularly, every day on a reliable scale. As long as they gain in weight from four to seven ounces each week, they should continue to nurse, but as soon as they show gradually reducing weekly gain, with proper care of the mother, they should be weaned (486).

606. Does this rule apply to infants of all ages?

Yes; where weaning is delayed too long, the digestive glands will be so injured that it will be very difficult to feed the infant, and many weeks or even months may transpire before it will show any increase in weight after being most carefully weaned and given only those foods most suited to its weakened digestive power (37).

607. Do any of these children die because they are nursed too long?

Yes; all of these infants become marasmic, more or less, and some of them die if a correct diet is not secured early;

that is, before the digestive glands are seriously injured (88).

608. Are continuously green, mucous stools in the newly-born infant dangerous after it commences to nurse?

They are very dangerous if the mother's milk does not produce some yellow color on the fourth or fifth day (706).

609. How long can such nursing be continued?

The infant should be weaned as soon as nursing fails to produce yellow stools. This requires only three or four days of nursing in the newly born infant or when it is six or seven days old (100).

610. What foods would you give when weaning is demanded at six or seven days old?

A very light cream from bottled milk sixteen to twenty hours old, diluted with four times as much boiling water and sweetened with one ounce of good milk-sugar or half an ounce of granulated to every fifteen ounces of the mixture. One ounce of lime-water may be added to every seven ounces of this and one to two tablespoons of the mixture fed to the infant about every two hours, or when it shows hunger. If the whole mixture is sterilized or pasteurized, it may be fed without adding the lime-water.

611. Is there any difference in the cream that should be used?

Yes; cream grows lighter and freer from milk in proportion as it becomes older during the first twenty-four hours. The power to digest skim-milk is very little in the new born infant, but increases with age. Gravity-made cream must be sixteen to twenty hours old and only the top of it from the bottle can be used during the first week. As the infant grows older, larger amounts of cream can be



taken off the bottle until three or more ounces are used daily when the infant is four weeks old (381).

612. After an infant is three weeks old, what changes should be made in the diet?

The proteid or skim-milk can be slowly added and increased as the infant's digestive power becomes stronger (231).

613. What foods has the infant been receiving in the diluted cream and sugar-water during the first three weeks?

The top of the cream is mostly composed of fat when taken from milk that stands in a bottle or mason jar from sixteen to twenty hours; but even in this light cream, there is a small per cent. of proteids and four and one-half per cent. of sugar. All of these are diluted in water, and with the addition of the seven per cent. of sugar in the sugar water, make a food mixture which contains from two per cent. in the first week to three per cent. of fat in the third week; seven per cent. of sugar and one-fourth per cent. in the first week to one-half per cent. of proteids in the third week (243).

614. Can the infant continue to thrive on this strength of food?

No; the healthy infant grows very rapidly during the first three months and requires great increases of food to make this growth (234).

615. In what way should the diet be increased?

As there are only three foods—fat, sugar and proteids—and baby has been taking all of them since it was born, the only way the diet can be increased is by giving more of one of these foods (243).

616. How much can the sugar be increased?

The sugar is at seven per cent. now and that, usually, is the largest amount an infant can digest perfectly, but with some, one or two teaspoonfuls of granulated sugar may be added to the daily food.

617. What effect will sugar produce if it is fed too freely?

It will ferment and cause gas, colic, loose, splashy stools and a scalding redness in the bowels and around the rectum extending all over the hips, if the sugar is not decreased (409).

618. How much can the fat in the diet be increased?

To about four per cent. or three to four ounces daily in those who digest fat perfectly, but many cannot digest successfully more than one or two per cent (240).

619. How will you know when too much fat is given and not digested perfectly?

When it lessens the appetite; causes vomiting an hour or more after meals; produces crossness and a gassy condition; disturbs the sleep or loosens the bowels with foul-smelling, greasy or rancid, buttery stools (385).

620. Can an infant thrive when overfed on fat or cream?

No; such a condition prevents growth, for it lessens the appetite and always gives the infant a pale yellow color (262).

621. What purposes do sugar and fat serve in the infantile economy?

They are consumed mostly as fuel to maintain the heat of the infant and the surplus is stored up as reserve fuel in the shape of fat. This is what gives the round, plump, pretty appearance to healthy, well-nourished infants (379 and 403).

622. How much can the proteids be increased?

The amount to which proteids can be raised is somewhat uncertain, but they can be increased steadily as the infant becomes older. The newly born infant can digest only about one-quarter to one-half per cent. proteids, while the infant of six to eight months can digest from three to four per cent. or fifteen to twenty ounces of skim-milk daily if the additions are made gradually and without injuring those glands which digest this food (241).

623. What purpose do the proteids serve as foods?

All tissues and all repairs are grown from the proteids. The infant's growth and development are dependent upon the amount of this food that is received and properly digested (389).

624. In what part of the milk are the proteids found?

In the skim-milk and some in the cream also; but only a very small part in that very light top cream suitable to the newly born infant.

625. How can you know when the proteids are over-fed?

The infant becomes cross and colicky and cannot sleep comfortably, waking very often and crying out with pain. The stools become green, show much mucus and often curds also. In some cases, part of the stool will be formed and the balance soft and splashy with curds in it. In other cases, the stool will be formed and well digested but carry a few curds also (392).

626. What makes curdy stools soft and splashy?

Too much sugar in the diet, when skim-milk is much increased (392).

627. Does the addition of skim-milk increase the proteids only?

No; skim-milk contains four and one-half per cent. of

sugar and one-fourth to one per cent. of fat in addition to the proteids. This increase of sugar in the skim-milk will often cause splashy stools in infants who are already getting enough sugar.

628. Which is the most valuable part of milk to feed to infants after the first month?

Skim-milk; for it carries all the foods—fat, sugar and proteids (95).

629. If nature has given us only three foods and has provided digestive glands capable of digesting only these three foods, how do you classify starchy foods which are fed so freely to infants and adults?

All starches are classified by nature as sugars, because they are converted into sugar by the digestive secretions (195 and 306).

630. If that is so, will not the addition of starch to the dietary soon overload the sugar digesting glands?

Yes; the increasing of starch always increases the labor of these glands.

631. What must be done then?

The sugar must be decreased steadily as the starch is increased (412).

632. How soon must the sugar be decreased?

As soon as the starch causes the gassy condition, looseness of the bowels or redness around and below the rectum (306).

633. Which of these symptoms shows first?

Generally, the redness below the rectum.

634. When is it well to commence feeding starch?

Very little can be fed during the first one or two months, but it can be steadily increased after that time if the child is not thriving on the other foods (303).

635. Are the mineral salts in the cereals of any value?

Yes; they supply the lime and other minerals needed in making bones and teeth (192).

636. Are infants injured and their development impaired by being restricted to human or cow's milk all the first year?

Yes; no mother can nurse an infant entirely and do justice thereto for a year (44). Few can nurse successfully more than six months, and no modified mixture of cow's milk can nourish an infant satisfactorily without an early addition of starch. All infants are improved by the addition of good starchy food as soon as they can digest it properly (264).

637. Is there much difference in the digestibility and nourishing qualities of the different cereals or starches?

They all differ somewhat. Oats are the most relaxing as they carry about eight per cent. of fat and cannot be fed where cream disagrees. Rice is the most easily digested and the most constipating. Wheat, barley and rice contain about one per cent. of fat and all make good infantile foods when properly prepared (307).

638. Can starches be fed raw like milk?

No; all starches must be malted, baked or boiled in order to make them digestible (326).

639. Which is the best way to prepare starch?

There is no best way for all infants. That method of preparing and that form of starch which makes the infant happy in daytime and sleep well at night is always the best for that child (324).

640. Are not all the proprietary foods made mostly of starch?

Yes; starch is the main ingredient in them (319).

641. How is the starch prepared in them?

The starch in Mellin's and Horlick's foods is prepared by malting. Nearly all the other foods are prepared by baking the starch (320).

642. Is a boiled starch as suitable for infants as the malted or baked varieties?

Yes; for some infants and no, for others. Where a boiled starch is properly digested, it is the best, as it is always fresh and sterile and the most economical form (307).

643. What effect does malting have on starch and on the infant who is fed upon it?

It converts the starch into a grape sugar which may act as a laxative on the infant and cause scalding of the rectum and hips. If it does not purge, it makes a nutritious food, very suitable to many delicate infants (320).

644. What effect do baking and boiling have on starch?

They partially dextrinize the starch, rupturing the cellulose envelopes containing it, thus allowing the digestive secretions free access to the starch itself (322).

645. Is a food containing only starch or one containing starch with other ingredients the most suitable for infantile feeding?

Usually starch is added to a milk mixture in an infant's food. Where milk foods are well digested, a food containing only starch should be added to it. This is the best food combination possible. When an infant cannot digest milk in any amount, some of the proprietary foods which can be fed without milk may be used temporarily (323).

646. Can starch be fed in any form as the only diet of an infant?

Neither starch, proteids, sugars nor fats can be fed as the only diet except for a short time. No infant can grow or

thrive on any single food, and it is very difficult to do so on any two foods. The perfectly developed infant has required the largest proportion of each food—fat, proteids and sugar or starch—that it could digest perfectly.

647. Are these foods obtained from cow's milk equal in digestibility and value with the same foods obtained in human milk?

No; especially during the first three to six months, the digestive power of the young infant has to be very gradually developed up to that point when it can partake of and assimilate enough of these foods from cow's milk to nourish it properly and enable it to grow satisfactorily. After three months of age, if it has been properly nursed or fed previously, the infant is generally able to digest enough of these foods to give rapid growth and ample weight (292).

648. Should there be regularity in the amount fed to infants from day to day?

Yes; unless this is observed, the feeding of the infant will be a repetition of mistakes and consequent digestive disturbances (651).

649. Does this regularity apply to nursed as well as hand-fed infants?

No; the nursing mother is often irregular in her nursing. She cannot tell how much the infant is getting and generally lets it nurse till satisfied. If it has taken too much, it usually corrects the mistake by vomiting the surplus (86). Vomiting surplus human milk does no injury. The hand-fed infant cannot vomit in this way, as it is generally sickened and injured by so doing (450).

650. How much may the amount fed daily vary without disturbing the infant?

When an infant is properly fed and properly increasing



in weight, an increase of more than one teaspoonful of any food oftener than every two or three days will soon cause indigestion, and a reduction of one ounce daily in the food mixture will cause loss of weight.

651. Is it necessary to observe regular times of feeding?

No and yes. In healthy infants who are digesting perfectly and growing steadily, digestion is more rapid at some hours than at others and they require their meals somewhat irregularly to meet their variable hunger. This may demand a variation of half an hour sooner or later for some meals each day, but the aggregate daily amount of food must be always the same, save the necessary increase as the child grows heavier to nourish and support the extra weight of the growing infant. Therefore, healthy infants—those who have healthy stools—must be fed when they become hungry.

Sick infants with weak digestive power—those who have soft, foul, mucous or splashy stools—cannot tell or show when they are hungry, as their food is partly decomposing in them and causes distress and discomfort like hunger. Such infants must be fed at regular intervals and the food changed in amount or proportions until the stools show perfect digestion and consequent formation. When this occurs, they become happy and can be fed when they become hungry, like healthy children are.

652. How should the times of feeding be regulated?

The mother should not keep the healthy infant crying for food more than five to ten minutes when she knows it is hungry, nor should she look at the clock and think it necessary to feed whether the infant wants it or not, simply because feeding time (so called) has arrived (505). If the infant is not calling for its food, it may be allowed to

wait or if sleeping, it may not be disturbed for a few minutes till it awakens.

653. Which principle in feeding is most successful from the time point of view?

That regularity which feeds the healthy infant within five to ten minutes after it becomes hungry. This means some irregularity in time, but must never allow irregularity in the whole amount fed each day (648).

654. State the effect upon an infant when hungry and kept waiting for its meals.

If, after the infant is hungry, it is compelled to wait 30 minutes, it will lose 4 to 6 ounces in weight weekly; 20 minutes, it will lose 2 to 3 ounces in weight weekly (503); 15 minutes, it will not change weight much (502); 10 minutes, it will gain 2 to 3 ounces weekly; 5 minutes, it will gain 4 to 6 ounces weekly (501).

655. Does the infant digest all the food it receives?

No; frequently, it cannot digest more than one-half the amount given to it.

656. What becomes of this extra food which the infant cannot digest?

It decomposes or sours in the stomach and bowels and causes crossness and irritability, and if the amount is large, it causes vomiting or diarrhea (450).

657. Is this rotten food poisonous to the infant?

Yes; when much of it is absorbed into the blood, it poisons the whole body and causes fever, convulsions and brain affections, besides kidney and bowel disturbances (698-701).

658. What treatment must be adopted in these cases?

The size of the meals must be reduced within the capacity

of the digestive fluid secreted for each meal, in order to show perfectly digested stools that are formed and free from bad or putrid odors (428).

659. Do infants of the same size always secrete the same amount of digestive fluid for meals?

No; some secrete much more than others, and an infant who has been wrongly or overfed enough to cause indigestion or diarrhea is seldom able to secrete as large an amount at each meal as it did before being thus sickened.

660. How must such infants with limited digestive secretions be fed?

With smaller meals given more frequently (230).

661. Which is the best way to feed an infant—with large meals and long intervals between or small meals and short intervals between?

There is no rule that can be applied to all infants. Many are ruined and fail to grow, even when partaking of suitable food because too much is given at each meal. These infants must be fed less at each time and the meals given more frequently, if necessary.

662. Will not frequent meals cause indigestion and sicken the infant?

Not if their size is inside the digestive capacity of the secretions thrown out at each meal-time.

663. How often can an infant be fed if this rule be observed?

There seems to be a large limit to this frequency. Infants are often fed every hour during or while recovering from sickness, and delicate or damaged infants with limited digestive secretions must often be fed thus frequently to introduce

enough food daily to secure growth or prevent loss of weight

664. Must these infants always be fed in the frequent way?

No; if this is properly done, the digestive power gradually increases and the meals can be increased by enlarging one or two of them a little every few days. In a few weeks, usually, they are able to take larger meals less frequently (247).

665. How can a mother know that she is feeding a correct proportion of the foods—fat, proteids and sugar?

The nursing mother knows it by the orange yellow color and pasty consistence of the stools, and the hand-fed infant shows it by the lemon yellow color and formed consistence of them with freedom from mucus, foul odors and much gas.

666. Are these features necessary for success?

Yes; they are. Continued success cannot be obtained without them.

667. Are there any features that may be present with formed stools, which should be avoided?

Yes; there must be freedom from excessive gassy discharges and also putrid or rotten odors (729).

668. Can these features show with stools that look healthy?

Yes; for two or three days before an attack of diarrhea, but they are always a warning to lessen the food and thus avoid sickness.

669. How does the infant show that it is properly fed?

By its happiness in daytime and good sleep at night.

670. When the stools are correct and the infant is cross and sleeps poorly, what is wrong?

Generally, it is hungry; but, at times, this crossness and poor sleep are due to too rapid increases in the food. In this latter condition, gassy and foul stools appear very soon (266). The hungry infant will be cross, but the stools will be healthy and there will be little or no gassy discharges.

671. What do green or mixed colored stools show?

Wrong feeding either in the quality of the food or the amount given (706). Mixed colors always show indigestion in the bowels.

672. Do these green and mixed colored stools show correct form and number?

No; they are always soft, mucous, watery, lumpy and may be numerous also.

673. What condition, if continued, will guarantee an infant's present and future successful growth and development?

Happiness in daytime, good sleep at night and one or two healthy, well-formed stools each twenty-four hours (294).

674. What is the underlying principle which must always be remembered in order to feed infants successfully?

It is never to forget that the digestive organs will only secrete a fixed amount of digestive fluid for each meal. This demands that more food must never be given than this will digest perfectly.

675. If a meal is too large, what will be the result?

Part of the food will decompose and cause distress (434).

676. How often will the digestive glands repeat this secretion in infants?

If not overloaded, they will repeat it every hour when the diet is one of milk foods, and every one and one-half hours when starch is added to the milk. In some very young

infants, small milk meals may be repeated more frequently than once each hour.

677. What advantage results from these frequent meals?

It enables poorly nourished infants with weak digestive organs to partake of a greater amount of food daily than they can obtain when taking only a few meals each day (428).

678. Can these frequent meals be made as large as when they are few in number?

The difference in the size of the meals is very little, and in many infants, who have been much damaged by improper feeding, the frequent meals can be made just as large as the fewer ones should be for good results, as damaged digestive glands only secrete a small amount at each meal and must be used frequently to obtain success.

679. When is it necessary to feed in this frequent manner?

Whenever it is impossible to make the infant happy and sleep well on a few meals daily (427).

680. What is a happy infant—one who sleeps well?

One who receives and digests perfectly enough food each day to make him grow the average amount needed at his age and size and thus continues to sleep perfectly (165).

681. Can an infant be happy or sleep well when imperfectly nourished?

Not for any length of time. An infant must receive and appropriate enough nourishment to increase in weight sufficiently or it will be cross in daytime and sleep poorly at night (438).

682. Which is the most successful baby?

The happy one.

Can an infant be successful who is not happy?

Yes and no. A nursing infant can, but a hand-fed infant cannot.

#### FACTS TO BE REMEMBERED

##### 683. NURSING:—

Few women can nurse an infant successfully for twelve months.

Many fail entirely during the first three months.

The nursing capacity of all women is reduced at some time.

The time of failure in nursing power varies from a few days in some to many months in others (44).

Gradual reduction in the quantity of milk secreted usually means an unfavorable change also in quality (39).

684. No mother should risk nursing her infant during the second summer. This causes expensive sickness and most generally is dangerous to the infant's health (44).

685. A woman whose breasts leak is not usually an abundant nurser.

Women who increase in flesh while nursing are generally poor nursers and have cross, thin babies.

When an infant nurses over ten or fifteen minutes, it is proof of deficient milk in the breast.

Frequent grasping of the nipple and letting go indicates shortage in milk supply (48).

686. When an infant stops nursing, it has had enough and should never be urged to take more.

Persistent nursing is always dangerous if an infant is becoming thin and white with unhealthy stools, especially when it causes colic and crossness in daytime with much broken sleep at night (36).

687. Good substitute feeding will not overcome the effects of bad nursing when both are continued together.



No infant is so hard to feed successfully and make grow as the one who has been nursed with unsuitable milk during the first few months of its life (37).

688. When feeding is done with the idea of making the infant grow, regardless of the necessity of securing healthy stools, it usually results in tedious, severe indigestion and a delicate baby (171).

689. FEEDING:—

The digestive glands of the new-born infant vary greatly in their size and foods must be adjusted to their capacity. Successful digestion is proven by the healthy character of the stools (232).

690. An infant should not be longer than ten minutes in taking a meal, whether nursed or bottle fed (85).

691. It must be fed regularly in daytime whether asleep or awake or within ten minutes after it becomes hungry, if the stools are healthy, in order to secure good sleep at night (438). It should never be awakened to feed at night.

692. A healthy infant over six months of age should not be fed after the parents retire. A drink of water may be given if needed.

693. Persistent night feeding after an infant is six months old always causes a nervous, wakeful, irritable child who cannot develop as well as it would on day feeding alone.

694. Night feeding usually means overfeeding or too limited day feeding (438).

695. An overfed infant means a poor sleeper at night and a cross one in daytime.

Overfed children are always subject to vomiting, feverishness, disturbances of the bowels, much gas, foul odors, loss of sleep and very imperfect growth and development,

with correspondingly pale, thin countenances and soft flesh.

Overfeeding is the greatest cause of infantile mortality, sickly and puny infants. It always causes an indigestion which may continue indefinitely.

Overfeeding any one of the foods always makes a restless and unhappy baby.

Overfeeding cream, skim-milk, sugar or any starch, whether home made, or in any proprietary food, damages those glands used in digesting it, and if persisted in, ultimately destroys many of them. This excessive and long-continued abuse permanently cripples the infant at the digestive point abused (13).

696. Every infant is crippled just in proportion as it has been overfed. These cripples or wrongly fed children are those who die early from slight sicknesses or grow up delicate and pale to die of tuberculosis, meningitis or Bright's disease later in life.

The successful growth and development of any infant depends upon two things:

1st—The selection of that fat, proteid, sugar or starch which it can digest perfectly.

2d—Upon giving that amount of each food which gives healthy stools, free from foul odors.

A hand-fed infant cannot thrive if it VOMITS.

A hand-fed infant cannot thrive if it IS HUNGRY MORE THAN FIVE OR TEN MINUTES BETWEEN MEALS.

A hand-fed infant cannot thrive if the STOOLS ARE LOOSE AND WATERY.

## 697. INFANTILE APPETITE:—

The appetite of the healthy infant is always correct if the food is suited to its digestive power.

Unsuitable mother's milk creates a false craving for food which often results in vomiting or diarrhea when satisfied.

Any food which irritates the stomach creates a false desire for more food in the young infant and nausea in older ones.

Too much cream reduces the appetite; substitution of skim-milk increases it (262).

Constant indifference for food demands a change in the proportions of the foods in the meal.

The overfed infant has a capricious and irregular appetite (222).

Varieties in each food change the taste and generally stimulate the appetite, giving greater and better digestion.

## 698. POISONOUS FOODS:—

All foods decompose and become poisonous and irritating when not properly digested. Each food in decomposing develops products peculiar to itself, but all are injurious and many are very poisonous. Animal foods in this condition are more poisonous than starchy ones.

Decomposition of any food, while being digested, always allows some poisonous products to enter the blood. These are eliminated by the kidneys.

699. These poisons may cause sickness of any severity from headache or slight fever to convulsions; or from slight nausea to the most violent diarrhea.

700. Continuous poisoning from undigested food, in time, may injure the kidneys, causing Bright's disease, or may injure some other organ, such as the liver, heart or brain with equally serious results (289).

701. Eczema and other skin eruptions are the common results of these poisonous digestive products.

702. TEMPERATURES:—

The temperature inside the body is higher than our hottest summer days. This always causes rapid decomposition of food when there is not enough digestive fluid secreted to convert it into healthy aliment. Only so much digestive fluid is secreted at each meal. When meals are larger than this amount of digestive fluid will convert into aliment, decomposition must result (674).

703. LAXATIVES:—

All laxatives are irritants and purge because they cannot be digested. Most of the foods in infancy act as laxatives when not perfectly digested (339). No infant can thrive well who is given every few days any medicine which purges.

704. CROSSNESS:—

The happy baby becomes the strong, fat baby. It is always the correctly fed one.

No infant is naturally cross.

Crossness in a healthy infant is always due to overfeeding, an unsuitable dietary, hunger or sickness.

The sickness is often due to some error that the mother can correct.

The cross infant is usually a poor sleeper.

Crossness is natural and desirable in convalescence from sickness (500).

705. STOOLS:—

Human milk makes orange colored, soft, pasty stools. They are seldom formed.

Soft, pasty character in human milk stools results from

perfect digestion. If large enough, they guarantee successful growth and development.

No substitute food can make stools similar to those made by human milk.

Only the yellow stool is healthy from a milk diet.

Human milk which gives only green stools is poisonous.

706. Green stools, if continued over a few days, especially when slimy, demand immediate weaning to avoid damaging the infant's digestive power (100).

A little green without slime is harmless in the yellow stool.

Continuously green, slimy stools without yellow will kill any infant, if allowed to continue. This applies to all ages but mostly to newly born infants (608).

Infantile stools usually turn green when exposed to the air for a few hours. This is healthy.

707. Hand-fed infants seldom succeed well when the stools do not show some formation (468).

708. Cow's milk gives one or two soft but formed stools daily when successfully fed. They are a light yellow with greenish shade. Additions of starch or meat darkens the color (232).

709. Stools from cow's milk or starches are dried out in the rectum, giving them form when they remain there eighteen to twenty-four hours.

710. Curds are the only hard lumps ever found in the stools of an infant fed on any kind of milk. They are yellowish white in color and any shape or size, but mostly as large as a bean or pea. Usually, there are only two to six in a stool, but there may be dozens (392).

711. Watery and curdy stools are always injurious and

cause sickness, fever and loss of weight. Curds are caused by overfeeding of skim-milk.

712. Pebbly and speckled stools show fair digestion in the upper bowel, but an extra secretion of mucus which is due to some irritable part of the food (392).

These pebbles of stool vary in size from a pin-head or rice grain upwards. There may be any number from a dozen to hundreds of them (393).

713. Frequent stools are nearly always soft.

714. One or two soft or watery stools daily will always prevent an increase in weight. Usually, they reduce weight. They are dangerous in proportion to their number, size and fluidity.

The last part of the stool is always softer than the first part and often contains mucus and froth.

715. Mucus is a natural and healthy secretion of the bowel. It is increased by unsuitable food.

716. Foamy stools show the result of overfeeding. The foamy character is due to fermentation.

717. Food should never be increased when the stools are frequent, foul, mucous, splashy or foamy (267).

718. Food can only be increased when the stools have the correct odor, color and formation (267 and 469).

719. Overfeeding is always followed by extra gas, foul odors, frequent mucous or splashy stools. This gas may be discharged from mouth or rectum (493 and 263).

720. Overfeeding of cream causes ropy, greasy, buttery or creamy stools with a rancid or foul odor (385).

721. Overfeeding of skim-milk causes mucus or curds in the stools which may be partly splashy and partly formed, or entirely green mucous in character (392).

722. Overfeeding of sugar causes watery, splashy,

gassy stools with redness and scalding in the bowels, around the rectum and over the buttocks (409).

723. Pasty white or clay-colored stools result from over-feeding mostly of milk, fat or starch. They are generally foul or sour smelling (325).

724. Dry, crumbly stools usually result from over-feeding of starch, skim-milk or condensed milk. These stools are foul odored and the infant passes much gas.

725. Foul, rotten-smelling stools of any consistence are due to overfeeding animal foods—milk, egg or meat. The food decomposes instead of being digested (213).

726. URINE:—

Milk-fed infants urinate very frequently.

Circumcision often lessens the frequency of urination.

Extremely large, frequent urinating shows too much water in the food (289).

727. Dark, staining urine often indicates overfeeding and approaching sickness.

Dark-colored urine may result from meat juice, bile, blood or medicines.

Very acid urine causes frequent urinating and often scalding.

728. Strong smelling urine shows decomposing food products (573).

Correct feeding reduces the foul odor of the urine.

729. GAS:—

Bringing up gas once or twice after each meal is natural and correct (487).

Gas rising frequently between meals is wrong and shows fermentation in the stomach. This is always corrected by lessening the meals or reducing that food in the meal which ferments.



Frequent gassy discharges from the bowels show intestinal indigestion due to overfeeding or unsuitable food.

Extra gas in the bowels results from fermentation or decomposition and is the common cause of colic (260).

Rumbling or gassy noises internally are commonly due to hunger. When due to indigestion, there will be large discharges of gas by the rectum also (489).

730. Foul odors are due to the decomposition of animal foods in the bowels (213).

Sour discharges of gas and stools are due to fermentation of sugars and starches (214).

The foul-smelling baby is either an overfed one or a dirty one.

#### 731. VOMITING:—

Vomiting is due to extra quantity of fermentation of food.

Overfeeding of cream or sugar causes vomiting of food one or two hours after meals (259).

Too much food causes vomiting five to fifteen minutes after feeding.

Changes of position, pressure on the stomach and dancing the infant often cause vomiting.

732. Vomiting immediately after meals returns the food before it becomes sour.

Sour vomiting may be natural or due to indigestion (333).

As the digestion progresses, the contents of the stomach always become sour. Very sour vomiting is commonly due to overfeeding of sugar or starch. Cold water will perpetuate vomiting.

733. Spitting and vomiting of water shows the food is too dilute (449).

After such an attack, all drinks must be very small and always hot also.

734. All forms of vomiting are corrected by giving the stomach a rest (246).

Rest can be obtained only by lessening the amount which enters the stomach. This often demands that nothing be given for several hours; in extreme cases even one or two days rest are needed.

The fear of starving the vomiting infant often prevents parents from giving the stomach enough rest to make a cure.

The popular idea is, "Give something to settle the stomach;" the correct idea is "Give rest to settle the stomach." The former is generally a failure. The latter is always a success.

## CHAPTER X

### DIET FOR SECOND AND THIRD YEARS

735. How should an infant be fed during the second year?

On the same principle as during the last three months of the first year.

736. Will you explain that principle?

The young infant develops digestive glands which can consume a larger ratio and variety of starchy foods after nine months of age than it could when younger. This allows these foods to be increased in number and in proportion as the child demands more food, and the sugar which suited the infant's digestive power so well when born must be reduced as the starch is increased. In this way, the infant during the second year can digest larger amounts and more varieties of starch. Eggs and broths may be added to or partly substituted for the milk.

737. What starches are suited to this age?

All forms of foods made from flour and cereals, and also potatoes when properly prepared.

738. Which way of cooking these best suits this age?

Boiling. Oat flakes, rice, barley, wheat flakes, farina and tapioca present the most suitable forms of these foods when boiled (329). Potatoes may be either boiled or baked. As they carry so much water, they do not become concentrated by baking.

739. Are baked starches unsuitable for infants of this age?

No; if given moderately, they can be used with advantage even after nine months (305), except in warm weather.

740. What forms of baked starches can be given?

Bread, crackers, toast, baked potato, soda biscuits, sweet cakes in small amounts and breakfast flakes (321).

741. Why are boiled starches preferable to the baked ones?

Infants at this age have very imperfectly developed digestive glands and are often very greedy. They enjoy the taste of the newly baked foods and demand them in large quantities. When allowed them by their delighted parents, they usually eat enough of these concentrated foods to cause indigestion and often more severe sickness. If fed in moderation, with the different boiled starches which carry so much water, they cannot so easily overload their digestive organs.

742. What is the main difference between baked and boiled starches?

All baked starches are concentrated by drying when baked, while all boiled starches are diluted by boiling. Otherwise, they are equal in value.

743. Do the boiled starches ever cause indigestion and loose, watery stools at this age?

Yes; very commonly mothers fall into the habit of giving the foods too dilute and also too much at each meal. The result is always the one so frequently made—more food given at each meal than there is digestive fluid secreted to convert it. This always allows decomposition of part of the food and frequently loose, foul, rotten stools also.

744. What must be done to correct this?

The watery food must be reduced greatly and dry starches—bread and crackers—given in place of the boiled

starches (771). This is especially necessary after seven months.

745. Do these infants thrive better after this change?

Yes; the loose, foul watery stools disappear and the infant quickly improves in spirits, sleeps well and increases in flesh when not fed too much dry food. This condition is very common as infants become older.

746. Should milk be increased in amount during the second year?

No; additions of other animal foods, such as eggs, beef juice and beef tea, are made at this age to meet the increasing requirements of the growing child (786 and 788).

747. Can any fruits or fruit juices be added to this diet during the second year?

Yes; oranges, baked or scraped apple, apple sauce, prunes, plums and peaches may all be given in small quantities if they do not disturb the digestion or show looseness of the stools (781).

748. Are fruits a valuable aid in nourishing a child?

No; fruits are only relishes like pickles, sauces and jellies, and should only be used as such. They are valuable to prevent scurvy when all other foods are cooked, and also valuable to relieve constipation in some infants, but not when fed liberally. They are never nourishing like milk, bread, etc. Young children are commonly injured by a liberal fruit diet, and, in many infants, fruits act like laxatives and cannot be given except sparingly. Some infants cannot take the smallest amounts without having bowel disturbance.

749. How many meals should the infant have daily during the second year?

Usually five; but some do well with four.

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750. What should be the standing rule in composing these meals?

Each meal should contain either milk, meat, egg, beef juice or broth with some form of starch, cereals, bread, cracker, toast, farina, rice or potato during the fall and winter.

751. Is it well to vary the food at the different meals?

Yes; a new taste gives a fresh impetus or stimulation to the digestive secretions, just as the pudding or pie gives a new eating desire to the adult after the meat course has satisfied his hunger.

752. How would you prepare milk during the second year?

In the same way as during the last months of the first year, only increasing the strength thereof as the infant's digestion shows that it is allowable. Some will be able to take pure milk at fifteen to eighteen months and others must have it diluted. The summer season always demands extra caution in this work, pasteurization being an absolute necessity during the hot months, with separate bottles for each meal of milk and starch food (208).

753. What would be the proportions and foods for these meals?

For the first one: Five to six ounces of milk diluted with three to four ounces of wheat, barley, rice or oat gruel, a small piece of bread and butter or an equal amount of toast. The amount of cream on the milk will be governed by the digestive power of the child. All may be sweetened slightly and also have a pinch of salt.

The second meal will be much the same as the first, with a little fruit substituted for part of the bread or toast if it is well digested.

Third meal: About half of the milk and gruel given at the morning meal and the balance made up with four to five ounces of chicken, beef or mutton broth some days and a poached or soft-boiled egg on the other days with bread, crackers or toast as needed.

754. Should this milk and gruel be given with the bottle?

There is no reason for or against the bottle except the sanitary one of absolute cleanliness coupled with the labor involved. Some infants can be and are weaned from the bottle at ten or fifteen months, while others are not weaned at two years. When the infant can and will drink food from a cup or glass, there is no reason for continuing the bottle longer than the first year.

755. How late should the last meal be given each day?

Those with four meals take it at bedtime, 7 to 8 P. M., and those with five meals may have it at the parent's bed hour, but all meals should be given by 6 P. M. to healthy infants.

756. What is the general principle in changing the food of the infant at this age?

Lessening the boiled cereals and foods and increasing the baked starches with small additions of fruits.

757. What general rule governs the amounts fed during these changes?

Only those amounts can be given which make the infant happy in daytime and sleep well at night. This is always found when the stools are one daily, well formed, uniform in color and free from bad odors (271).

758. Can meat be fed to infants during the second year? To some, a teaspoonful of scraped chicken, mutton or beef may be given, mixed with potato or bread crumbs instead



of the egg, once a week. This can be repeated more frequently as the infant grows older (766).

759. Is water beneficial at this age?

Yes, especially in summer; but water should not be forced on the infant at any time.

760. When should an infant be forced or coaxed to take food or drink?

Forcing the food or drink is always an error. Healthy infants take enough; their error is too often the opposite—they take more than they can digest. Coaxing an infant to take more is applicable only to those who are convalescing from sickness and need more nourishment. Even in these cases, harm is frequently done by too much coaxing (591).

761. How many meals are requisite during the third year?

Generally, four; the night meal being omitted.

762. How should the foods be changed at this age?

Milk can be given pure; more solid food used; fruit can be given with or before breakfast; butter added to the bread and egg given at breakfast time twice each week.

The second meal is a small lunch and given before the midday sleep. It is not as large as the first meal, and may contain broth or milk taken with bread or crackers.

The third meal will contain scraped or finely chopped meats, potato, baked, boiled or mashed, rice with vegetables, such as fresh peas, beans, asparagus, spinach or celery, all well cooked and mashed finely; bread and butter, custard or junket twice weekly, and prunes, apple sauce or baked apples as dessert on the other days.

The fourth meal will be a lighter one and composed of eight or ten ounces of milk with some form of starch, such as arrowroot, barley, farina, bread, cornstarch or toast.

763. Cream—This is a very important food to use or avoid, according as it is digested. Most of the infants are benefitted by it, but in some cases, it acts as a cathartic or emetic, and consequently, is injurious. It can be used as a dressing for foods or to enrich skim-milk itself when perfectly digested.

764. Milk—This is the basis of all foods, but not more than a quart should be given daily. When cream is not digested, skim-milk must be used instead of whole milk. Even this may demand dilution to secure good digestion. Some infants have been so damaged by overfeeding with milk during the first few months of life that they can digest very little of it and water must be substituted as the drink.

765. Eggs—They must always be fresh and prepared by soft boiling or poaching. One daily is enough for a child in the third year and the milk should be reduced at that meal.

766. Meat—In some form, tender and properly cooked, it should be fed once daily, but not at the same meal with egg. The best forms are roast beef or lamb, beefsteak, mutton chop and chicken, cut or scraped finely. Fish may be fed once each week instead of the meat. Beef and mutton should always be given rare (787).

767. Potatoes—These are generally a favorite food with children, even during the second year. Some parents are foolish enough to feed them during the first year (313). Many infants will consume them in large quantities if allowed.

When potatoes are ripe, dry and well cooked, they make a very good food, containing about twenty-five per cent. starch; but they should never be fed to young infants during the summer season, as they frequently cause indigestion

and diarrhea. This is because the old potatoes are spoiled before the warm weather and the new ones are, like green fruit, not matured enough to be easily digested. Potatoes can be boiled, baked or mashed, but should never be fried or scalloped for young children. They can be dressed with cream, butter, gravy or beef juice and a little salt.

768. Vegetables—Of the green vegetables, spinach, asparagus, string beans, green peas, squash and stewed celery may be used in rotation or one daily.

769. Cereals—All of these can be used, as they are mostly starch. The most important feature is to have them properly cooked in order to be easily digested. The list of these is very large, as it takes in wheat grits, all breakfast flakes, rice, hominy, arrowroot and farina. A few years back, the different raw grains were used, but they required three hours steady boiling before being fed. At present, all cereals can be obtained in flake form, previously cooked, and require not more than twenty to thirty minutes boiling before serving (329).

Where cereals are used in the form of meal, they cook perfectly in twenty minutes quick boiling and are served with milk, cream and sugar.

770. Broths and soups—Meat broths or soups are very valuable as an addition to the infantile dietary, but cannot be used as substitutes for milk except in one meal each day or during a temporary indigestion from overfeeding of milk. Meat broths are much more valuable than vegetable broths on account of their strength and also on account of the pleasant taste and relish they impart to the bread, flour and cereals which are made so palatable when added to them. Without these additions, broths and soups would have little nutritive value. Experience shows that animals fed on them

alone starve rapidly. Beef juice is stronger than the broths and can be used more extensively as a substitute for milk. The broths make a good diet on which to rest the over-worked stomach in many infants.

771. Bread and crackers—These form the staple diet of the healthy infant and can be part of every meal in some form. They can be used with butter as infants grow older, the younger ones having milk or cream as a dressing. Toast, stale bread and zwieback are the most desirable forms of bread; and gluten, graham and butter or soda crackers are most acceptable in the cracker line (790).

772. Sweet goods should be used very sparingly, as they induce a false appetite and craving for excessive amounts of these foods and also a distaste for the plainer and more reliable dietary (591).

773. Desserts—Very few desserts are allowable to young infants and those allowed must be very simple, easily digested ones and given in small amounts. The most reliable ones are custard, rice pudding and fruit. Junket may also be used when milk is not given at that meal. The nature of the infant's dietary does not call for desserts.

774. Fruits—Different kinds of fruits can be obtained at all seasons of the year and small portions thereof can be allowed as they come in season. The most marked exception to this will apply to those of great acidity or hardness, or when they are not thoroughly ripe. The quantity fed must always be controlled by proof of perfect digestion and the fact that they are only relishes and carry little nutrition.

#### FORBIDDEN ARTICLES

775. Indulgent parents feed almost every food to the infant on the ground that they now have teeth, but some

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articles should be refused till they are four or five years old.

776. Meats—Pork, ham, sausage, dried and corn beef, salt fish, liver, bacon, kidney, meat dressings, duck and goose are all difficult to digest.

777. Bread and cakes—Hot bread, rolls and biscuits, griddle cakes, much sweet cakes, particularly those with fruits or frosted.

778. Vegetables—Potatoes in all forms during hot weather and fried or scalloped at all seasons, cabbage, onions, cucumbers, tomatoes, beets, radishes, green corn, baked beans and fried egg-plant.

779. Desserts—Candies, dried canned and preserved fruits, nuts, pies, tarts and pastry or much ice cream.

780. Drinks—Wine, beer, cider, tea and coffee.

781. Fruits—Stale fruits and those out of season, all hard kinds and those that are very sour.

## FOOD FORMULAS

782. No. 1—Starch-waters. Starch water can be made from cooked oatmeal, rice or wheat flakes, rice or barley flour by using two tablespoonfuls of the flakes or one tablespoonful of flour to a pint and one-half of water and boil one-half to one hour. This should make one pint of the finished product, and enough boiling water should be added, if necessary, to make this amount.

783. No. 2—Starch jelly. This is made by using double the amount of the grain or flour to the same amount of the finished product. It is made by boiling in the same way and takes about the same time.

784. No. 3—Gluten-water. Gluten-water is made from any grain, preferably barley or rice, by boiling four to six

tablespoonfuls of the whole grain in a quart of water. It requires one hour's boiling to dissolve the gluten from the grain and should measure one pint when finished. The grain can be strained out when the boiling is ended. Gluten-water also contains a certain amount of starch and is more suitable for delicate stomachs than a pure starch-water, as it is more easily digested. Gluten is a vegetable proteid, easily digested and very strengthening (315).

785. No. 4—Albumen-water. Put the white of one egg in one-half glass of water; stir slowly for about five minutes. It must not be whipped, as that makes it frothy. Strain through cheese-cloth, sweeten and flavor, if necessary, to suit the child.

786. No. 5—Beef tea. Add one pound of lean, minced beef to one pint of luke-warm water. Let stand for one hour and then simmer slowly for one hour on the fire. When cold, remove the fat before feeding. Mutton, veal and chicken broths are made by using these meats instead of beef.

787. No. 6—Meat balls or cream. Scrape fine tenderloin steak into shreds with a dull knife. Season with salt and make into little balls or mix with a little water, making a cream thereof for young children. This may be fed warm or cold. It will often be retained on a tender stomach when other foods are rejected. One or two teaspoonfuls can be fed each day to children nearly one year old. Overfeeding these foods causes foul, dark stools (213).

788. No. 7—Beef juice. This may be made by the hot or cold process. By the hot process, beefsteak is slightly broiled, cut into squares and these pieces squeezed in a lemon or meat press. By the cold process, the meat is cut up fine and soaked for three hours in half its weight of cold water;

then squeezed through a towel, meat or lemon press. More than twice the amount of meat juice of the same strength is obtained by the cold process.

789. No. 8—Junket, curds and whey. These are obtained from fresh cow's milk by adding one teaspoonful of liquid rennet or sherry wine to half a pint of fresh cow's milk at a temperature of one hundred degrees. Stir all well and allow it to remain at this temperature one-half hour. The milk should then be well whipped with a fork and strained through a cheese-cloth. Remove the curds or junket and season with salt before feeding. The whey can be fed hot or cold and with wine, if necessary. It is a very light food and may be used in cases of feeble digestion (395).

790. No. 9—Dried bread. Fresh, soft bread is injurious to the infant with a tender stomach, but as bread is necessary in feeding children, it should be used in the stale or dried form. This is made by cutting it in small slices and drying quickly in a hot oven with the door open (771).

791. Where toast is required, the drying process may be continued still further until the outside of the bread is browned. By this process, the yeast germ in the bread is entirely destroyed, thus making the starch more digestible. If too hard for the little one, it can be soaked in water or milk before being fed; but it is preferable to crush it and feed in the dry state. Feeding in this way is a slower process, as it demands the saliva in the infant's mouth to soften it. In this way, the starch is partly digested in the saliva before entering the stomach. This enables the infant to consume larger amounts of starch than is possible when it is fed in the wet condition.





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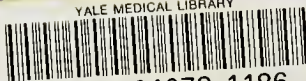
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